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27th October 1992

It is hard to believe that the SUC is at the end of its twelfth year; and even harder to believe that more than seven years have elapsed since a new Committee, led by Andrew Ferguson, took over from the staff and students at Yeovil College.

Yet here we are, heading fast for 1993, with our favourite old Sharp computers crawling out of the woodwork all over the place - boot fairs, jumble sales, auctions - and still going strong. As often as not the computer has lost its Manual, and frequently its master tape or disk as well (I can see why Manuals go astray, when you've had a machine for long enough you hardly ever look at the Manuals; but how do people manage to lose ALL their software ?).

We are now the only source of practical support in the U.K., for these older machines; Kuma, Sharpsoft, and even Sharp Electronics themselves now refer all enquiries regarding such machines to us, and in virtually all cases we can and do help a new owner to get his machine up and running. Not surprisingly, we have enrolled 70 new members so far this year, many of them through such channels.

Yet our membership is lower than it was at this time last year; for some reason or other, we have lost more than 70 of our 1991 memebers. The situation is in no way desperate, but it means that I must plead with you all to re-enrol for 1993 as promptly as you can, using the form stapled at the centre of this issue. To be realistic, we need about 75% of you to re-enrol before the end of January 1993 if we are to continue publishing the Magazine in its present format; so please remove the form, fill it in, and send it with your subscription to John Duxbury, immediately if not sooner.

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You will note that in this issue Mike Mallett, in conjunction with Peter Tuffs, has launched a new section covering the field of 'Communications' i.e. computers talking to one another via serial RS-232 interfaces, along telephone lines. This is a growing area of interest, and a very useful one at that, and I hope that those who can do so will contribute to Mike's new section.

As a result, we are more than ever keen to find someone who can help Mike by sub-editing the 'Handheld' section. I would be very pleased to hear from anyone on this, even handwritten material, which I would gladly type up myself, to keep this section alive.

We recently received a 'mailshot' from the organisers of the 'All Formats Computer Fairs', which seem to happen regularly in London, Birmingham, Glasgow, Leeds and Bristol, and have recently expanded to Donnington Park, Haydock Park, and the Northumbria Centre in Washington. I shall try to get to Bristol on Nov. 15th, and report back; meanwhile, to find out more, ring 0608 662212.

Finally, for newer members, if you haven't got the 1990 and 1991 back issues, buy them NOW at reduced prices before stocks expire!

A very Merry Christmas 1992, and a Happy New 1993 to everyone!!!

* Vol.13 No.1 will appear in March 1993, deadline 10/02/93 *

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BACK ISSUES AND SOFTWARE MANUALS (POST FREE, FROM WEYMOUTH)

Old issues (2/1, 2/3, 3/2, 8/3) 60p each/£2-00 for 4) NOTE
SUC Vol.10 (No.'s 1,2,3) £2 each/£4-00 for all 3) REDUCED
SUC Vol.11 (No.'s 1,2,3) £2 each/£4-00 for all 3) PRICES!

SM I ('K' SP-5060, SP-5060 EPSON, Hu-BASIC, Z80 MACHINE) £2-00
SM II ('K' Hi-Res programs by J.J. Labarthe) £1-00
SM III (MZ-80K/B/A/700/800 computers & their Basics) £2-00.

ITEMS FOR SALE THROUGH THE S.U.C.

VERY CHEAP MZ-80K COMPUTERS AND EXPANSION BOXES

During the last three months your Committee have speculated some small sums on the bulk purchase of several old MZ-80K Computers from one source, and several MZ-80K Expansion Boxes complete with standard Sharp disk and printer cards from another source. We can now offer these to members at ridiculously low prices:-

MZ-80K COMPUTERS

These were purchased in the North of England, and are currently being looked after by member Peter Hustler, in Bradford. They have had a fairly hard life in a school; some of them are in working order, some are not (but the faults are minor). We are asking £20 for a machine in working order, and less for one that is not, but PLEASE NOTE that these prices do NOT include carriage. If you are interested, give Peter Hustler a ring on 0274 663510.

MZ-80K I/O BOXES WITH DISK & PRINTER INTERFACE CARDS

These were purchased in the South of England, but they were then split between Andrew Ferguson, Maurice Hawes, and Paul Trainer, for ease of storage, and to make it easier for members to pick them up personally and thus save carriage. As far as we know they are all in working order and will be sold as such, so in the unlikely event of a problem a replacement will be made. We are asking £15 per box, but again this does NOT include carriage. Contact the person who lives nearest to you (the addresses of Andrew, Maurice and Paul are all listed on the previous page).

SHARP BOOKS

All available from the Chief Editor in Weymouth

*** All book prices post free U.K., overseas members add £1 ***

Bargain Basement at only £1-00 each

Starting Machine-code on Sharps	Starting with the MZ-700
The MZ-80K and MZ-80A Explained	The MZ-700 Explained
Peeking and Pokeing the MZ-80A	Peeking and Pokeing the MZ-700

(N.B. I have only 3 copies left of P&P MZ-80A, and only 6 copies left of P&P MZ-700, so if you want either one of these, buy now!)

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Sharp MZ-700/800 Exposed - £4 Guide to MZ-80B graphics - £3
MZ-80A Manual (SUC version) £10

Sharpsoft MZ-80 User Notes Vols. 2,3,4,7,9-18) all 50p each
Sharpsoft MZ-700 User Notes Vols.1-3, 5-9, 11) (will haggle)

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<P.S. I have sold out of MZ-700/Centronics printer leads>

ITEMS FOR SALE PRIVATELY

*** Paul Trainer (Leeds, 0532 498985) has items for sale as listed below. The prices given are for 1 off, and they do NOT include carriage. All computers have a selection of SUC software:-

3 off MZ-711 NEW, with Manual and all leads, £55
5 off MZ-721 good order, new MZ-800 recorder, no Manual, £30
13 off MZ-700 EPROM CARTRIDGE with 6 x 32K Eproms, £12
16 off MZ-700 EPROM board modified to fit centre blanking box, £12
20 off MZ-700 EPROM I/F board not modified as above, £10
1 off MZ-700 Plotter/Printer £30
1 off MZ-1R12 RAM board, 32K (see 700 section this issue) £20-00
3 off MZ-80B computers, v.g.c., with Manuals, £65
1 off MZ-80B tape PASCAL (2 tapes & Manual), NEW, £15
1 off MZ-80B FDOS (disk & thick Manual!), NEW, £20
3 off MZ-80FB dual disk drives with leads £40
1 off MZ-80SFD single 5.25" drive with leads, good condition, £30
1 off Sharp P5 printer, £45
1 off MZ-80A computer, no Manual, £45
1 off MZ-80A Expansion Unit (no cards) £20

Also several small items for the cost of postage - see last issue.

*** CBM (alias Sharpsoft) (071 729 5588): a few MZ-80K Owner's Manuals, NEW, £15-00 inc. post (ask for Mr. Leslie Herbert)

*** Peter Gregson (Southport 0704 538742) has a broken MZ-700 for sale, good for spare parts, £20 o.n.o.

*** Julian Higman (Wantage, 02357 66931): MZ-80K with I/O box and 2 cards, twin disk drives (ONE drive defective), all MZ-80K Manuals, Zilog Z80 Manual, FDOS. Needs space, £60 o.n.o.

*** Mrs Abilade (Oxford 0993 775685) offers an MZ-700 with a tape deck & plotter/printer, original box, Manuals etc. £40

*** The Chief Editor has been asked to handle the sale of a clutch of Sharp business machines (3 x MZ-3500, 1 x MZ-5500, all with B/W Monitors, plus 1 extra MZ-3500 COLOUR Monitor). The seller would really like to dispose of these items all in one go, and is looking for around £300 for the lot. But I am authorised to haggle, so ring 0305 783518 if you might be interested.

ITEMS WANTED

*** Alf Gibbs (081 531 1666) is looking for an MZ-800, with or without peripherals, good price offered.

*** Norman Rowe (Yorkshire, 0430 861304) is looking for an MZ-80A Expansion Unit with disk and printer cards, and Sharp twin disk drives. Also most of the early SUC back issues.

*** Paul Trainer (0532 498985) is looking for an MSX computer - for cash, or in part-exchange or as a straight swap for any of the items listed under his name in the SALES section above.

*** Geoffrey Heys (Tel. (work) 051 794 2000 Ext 5034) wants a RAM expansion board for his PC-5541 IBM-compatible laptop, or the information on how to make one for himself. Can anyone help ?

THE EDITORIAL COLLECTION

Since I took over as Chief Editor I have built up a collection of Sharp computers which contains most of the pre-IBM models marketed in the U.K. The main reason for doing this was to put myself (and the SUC) in a position to support these machines.

I have recently succumbed to the temptations of two later Sharp machines which are XT-compatible. I do not intend to go very much further along this line, as Mrs J. Hawes is starting to complain!

Some recent new members have acquired Sharp machines which look as if they might be IBM-compatible, but are not. So I thought it might be useful to list my machines, and briefly describe them. The list is in chronological order, and does not include software (software for most pre-IBM Sharps was listed in Vol.11 No.3).

MZ-80K (1979): Z80-based, 48K RAM (max), built-in tape deck, KBD, VDU (B/W 40-col.), needs external Expansion Box plus cards to drive a printer and/or disk drives. Disks are 5.25" DS SD 35-track, 140KB per disk. Cannot run CP/M without serious mods.

MZ-80B (1980): Z80-based, 64K RAM, built-in tape deck, KBD, VDU (Green, 40/80-col.), needs internal Expansion Box plus cards to drive a printer and/or disk drives. Sharp disks are 5.25" DS DD 35-track, 280KB. Can run CP/M (disks are DS DD 35-track, 350KB).

PC-3201(1981): Z80-based, 64/112K RAM, separate KBD & VDU (Green, 80-col.), BASIC-in-ROM, built-in printer I/F and expansion slots, needs card for separate disk drives. Disks are 5.25" DS DD 40-track, 320KB. Can run CP/M (but see PC-3201 section, this issue, for more on this, and also details of software).

MZ-80A (1981): Z80-based, 48K RAM, built-in tape deck, KBD, VDU (Green, 40-col.), needs semi-external Expansion Box plus cards to drive a printer and/or disk drives. CP/M runs in 40 cols. but SUC 80-col. mod. really needed for this. All disk formats same as MZ-80B.

MZ-3500(1982): Z80-based, 64K RAM, built-in 5.25" drive(s), RS232 & printer I/Fs. Separate KBD & VDU (80-col. Green or colour). Sharp Disk format DS DD 40-track 320KB. Runs CP/M (disk format similar, but incompatible).

MZ-700 (1983): Z80-based, 64K RAM, built-in KBD and Sharp printer I/F, optional tape deck, needs external Expansion Box plus card to run 5.25" drives. Can also run QD, this needs a special I/F and/or SUC eprom. Output (B/W or colour, 40-col.) needs ext. VDU or TV set. CP/M runs in 40 cols. but SUC 80-col. mod. really needed for this. All disk formats same as MZ-80A/B.

MZ-5600(1983): 8086-based, 256/512K RAM, 5.25" drive(s), RS232 & printer I/Fs. Separate KBD and VDU (B/W or colour). Can run CP/M-86 and Sharp's own special version of 'MS-DOS 2.11' which is <<<NOT IBM COMPATIBLE>>>. Disk formats DS DD 80-track 640K (CP/M) 720K (DOS).

The MZ-5500, which I do not have, is similar to the MZ-5600, but its 5.25" disk drives are 40-track, giving 320K (CP/M) 360K (DOS).

MZ-800 (1984): Z80-based, 64K RAM, built-in KBD, Sharp/Centronics printer I/F, 2 expansion slots (needs I/F card(s) to run 5.25"/QD drives). Optional tape deck. Output B/W or colour 40/80-col.) needs external VDU or TV. Sharp disk format DS DD 40-track 320KB. Runs PCP/M (disk format similar but incompatible).

PC-7000A(1985): IBM-XT compatible laptop, 8086-based, 384KB RAM (expandable to 768KB). Twin 5.25" 360K floppies. For more details see MS-DOS section, this issue.

The PC-7100, which I do not have, is similar to the PC-7000A, but it has a 20MB hard disk in place of one of the 5.25" drives.

ZY-1000(1987): My latest acquisition; Sharp's other name for this animal was 'PC-typewriter'; an electric daisy-wheel typewriter with a PC-7000A in its base compartment. For more details, see MS-DOS section, this issue.

GENERAL COMMENTS

As far as I know, the only pre-IBM Sharp that I cannot support at all is the PC-5000, an experimental machine with bubble memory.

As I do not have an MZ-5500 it is difficult to support, but with help from my MZ-5600, and John Edwards, I can usually manage.

All my machines have 5.25" disks, and my MZ-80B has a 10MB hard disk - this is the ONLY machine on which I can support hard disks.

I have a standard MZ-80K, another MZ-80K with a ROM switch which allows me to run CP/M (but only in 40 columns), and another MZ-80K fitted with Quantum 'Hi-Res' and Tony Kemp's extensions thereto.

My MZ-80A has the SUC 40/80-column ROM Monitor.

My MZ-700 has the SUC multi-eprom by John Edwards, which can run a QD system via an MZ-800 card. It also has John's 80-column mod.

My PC-3201 has the MicroTechnology 'relocator' board, and can thus run their version of CP/M (which is better than Sharp's).

The MZ-80K, MZ-80A, MZ-700 and MZ-800 all use the 'Sharp ASCII' set, in which lower-case character codes are non-standard. All the other machines (even the MZ-80B) use standard lower-case codes.

I have all Sharp 'P' printers (P3, P4, P5 and P6); the P4 and P5 can be 'customised' (see 'Sharp Printers' article, this issue).

I also have an Epson FX-80, and Epson RX-80, an NEC 8023, and a Dyneer DW12 daisywheel printer (which prints this Magazine).

I also have a 1982 Epson QX-10 computer (Mon Dieu!!)

(The QX-10 comes in handy for swapping disk formats. Honest!) ***

RUNNING M/C FILES FROM DISK BASICS by Maurice Hawes

INTRODUCTION

A recent innocent enquiry from John Keyworth led me into a maze of problems connected with the apparently simple task of 'RUNNING' a machine-code program from a disk Basic. As a result, I now know that Sharp disk Basics use a very complicated procedure to do the job, quite different from the method used to load a machine-code tape from a ROM 'Monitor'. And in the end, John's enquiry gave rise to other very unexpected, useful, and interesting results.

LOADING MACHINE-CODE TAPES

This is the essential background. When you load a m/c program off tape via the ROM Monitor on the MZ-80K/80A, the program is put straight into its specified location, which MUST be above $1000 (and is usually $1200 or higher). Video RAM starts at $D000, so the program is limited to $1200-$CFFF i.e. a filesize of $BE00.

Loading a m/c program off tape via the IPL on the MZ-80B is more complicated. The IPL, at $0000-$2000, loads the program within the area $8000-$FFFF, then the IPL is bank-switched out and the area $8000-$FFFF is bank-switched to $0000-$7FFF. So on the MZ-80B, in this mode, the m/c program is limited to a filesize of $8000.

On the MZ-700, a m/c program loaded off tape by the ROM Monitor is put straight into its specified location. As on the MZ-80K and MZ-80A, the lower limit is $1200, and the upper limit is $D000 (the video RAM is switched in at this time). So the program is again limited to a filesize of $BE00. (N.B. after is has loaded it may be, and often is, bank-switched down to $0000).

On the MZ-800 the situation is very complicated on account of the various different RAM/ROM modes that may employed, but for present purposes we can assume that it is the same as the MZ-700.

To summarise the position: when loading a m/c program off tape, it may be up to $BE00 in size on the MZ-80K/80A/700/800, and up to $8000 in size on the MZ-80B, and in many cases (but not all) it is put straight into the location for which it is intended.

BACKGROUND TO THE DISK PROBLEMS

The ball-game really started in August 1992, when John Keyworth complained that he could not load the QD version of S*CALGO on his bog-standard MZ-800 QD system; he had also tried to load it under disk Basic 2Z-009E on his 700, but got "memory capacity error".

(Some time later, John found that S*CALGO runs on the MZ-800 in MZ-700 mode; in retrospect, it was lucky I did not know this at the time - we might well have missed what was to come!)

I am not very familiar with QD's, so I started by looking at the "memory capacity" problem in 2Z-009E. To my surprise, I found that when you 'RUN' a m/c program from 2Z-009E, it is first loaded at $8604 (just above the Basic program start address at $85FE) and then copied up or down to its specified destination. The reason for "memory capacity error" was now clear - S*CALGO is $BE00 bytes long, so there wasn't enough room to initially load it at $8604!

I then tested SB-6510 on the MZ-80B, and was not surprised to find that it first loads a m/c file at $675C (the Basic S.O.F) and then copies it up or down to its specified destination. But I also found that the last part of the SB-6510 'RUN' command is 'bugged'. If a file has to be copied DOWN, no problems; but if a file has to be copied UP the calculation of its TOP address is 1 too high. So the copy has an extra byte at the end, and its first byte is lost.

Knowing this, I turned to SA-6510 on the MZ-80A, fully expecting it to be 'bugged' as well - but not so! As on the MZ-80B, the file is first loaded at $675C; but thereafter, in all cases, the final copying procedure, up or down, is correctly carried out.

I then checked SP-6015 on the MZ-80K. The file is loaded at $672E (S.O.F is $652C!) and then copied correctly in all cases.

Finally I looked at K&P DBASIC on the MZ-700, and was amazed to find that it does NOT start by loading a m/c file at the S.O.F. address. Somehow or other (and we have not yet found out how) it manages to load a m/c file straight into its specified location!

FILESIZE LIMITATIONS

Our first success, chronicled in the MZ-700 section of this issue, was to get S*CALGO running from K&P DBASIC; this proved conclusively that K&P DBASIC can RUN m/c files $BE00 in length. By that time it was also clear what the filesize restrictions would be with the Sharp disk Basics:

DISK BASIC	FIRST LOAD ADDRESS	TOP LIMIT	SIZE LIMIT
SP-6015	$672E	$CFFF	$68D2
SA-6510	$675C	$CFFF	$68A4
SB-6510	$675C	$FFFF	$98A4
2Z-009E	$8604	$FFFF	$79EB

I tried to 'RUN' S*CALGO (size $BE00) under SA-6510 and SB-6510. All I was hoping for was an error message, but no such luck - both Basics tried to load the file and crashed! I think we may deduce that these Basics do not check memory under these circumstances.

THE 'RUN' BUG IN SB-6510

Our second success, noted in the 'B' section of this issue, was due to John Edwards, who corrected the 'RUN' bug in SB-6510 by rewriting the code to make room for two extra DEC HL bytes.

I checked that the bug does not occur in other disk Basics, and double-checked by disassembling the relevant sections of code. In SA-6510, the code is exactly the same as in SB-6510, except for extra DEC HL bytes at $43F3 and $43F6; it therefore looks as if Sharp spotted the error, put in the DEC HL's, but then forgot to go back and correct SB-6510. In SP-6015, the relevant code is at $45B1-$45BF, and the bytes at $45BD and $45BE, DEC HL and DEC DE, ensure that the copying-up procedure is correct. Likewise, the relevant code in 2Z-009E contains DEC HL at $5B75 and $5B78.

The bug cannot arise in K&P DBASIC because it puts a m/c file straight into its specified location.

OVERWRITING THE COPYING SUBROUTINE

These tests showed that the 'RUN' sub-routine which copies a m/c file up or down in memory is itself moved, before it is executed, to a location outside Basic. This location varies; in SP-6015 it is $11A3-$11BB; in SB-6510 it is $FF10-$FF1D; in SA-6510 it is $11EF-$11FC; and in 2Z-009E it is $FF80-$FF8F. (N.B. In SP-6015, 5 extra bytes are moved, to $11BC-$11C0, but they are superfluous).

The purpose of this move is to prevent the copying routine from being overwritten by the final copy of the program being loaded. Seen in this light, the above addresses are logical, but they are not always safe. For example the disk version of Knight's MZ-80B 'Commander' occupies $FA00-$FFFE, and if loaded from disk it will overwrite the copying sub-routine in 'RUN' before that sub-routine has done its job. Our third success was to move this sub-routine to $F910-$F91D, so that the 'Commander' could be loaded off disk.

It is possible that some MZ-80A m/c program might overwrite the area $11EF-$11FC; this is a point to watch. On the MZ-700, under 2Z-009E, the area $FF80-FF8F looks safe, but might not be! On the MZ-80K, the area $11A3 - $11BB (the keyboard input buffer) appears to be quite safe - why did Sharp change it in their later Basics ?

MONITOR PROBLEMS

Many (but not all) m/c programs assume that a known 'Monitor' program will be available in the lowest part of memory. On the MZ-80K and MZ-80A, this assumption is well-founded.

On the MZ-80B, RAM Monitor SB-1510 is incorporated in all the standard Basics, and programs which need a Monitor will either assume this one, or incorporate a Monitor of their own. So on the MZ-80B, Monitor problems are unlikely when the m/c program is being loaded from a Basic. But there are other RAM Monitors for the MZ-80B, such as SB-1511 Monitor used by MZ-80B 'PASCAL', and this is a point to to be watched.

On the MZ-700 the real problems begin. Each of the Sharp Basics 1Z-013B and 2Z-009E contains its own RAM Monitor, and there is also ROM Monitor 1Z-013A. Most m/c programs assume that the ROM Monitor is in place as at switch-on. But if you load a m/c program from a SHARP BASIC, the appropriate Basic RAM Monitor will be in place, and this may not be what the m/c program expects to see.

Some MZ-700 m/c programs anticipate this, and their first action on execution will be to switch the ROM monitor IN; such programs cause no problems. But any m/c program which does not do this will cause problems if loaded from a SHARP DISK BASIC; the program will probably load O.K. but then crash. In such a case, pressing the RESET button (RESET + 'M' if you have a QD I/F) will return you to the ROM Monitor, from which you can try a J(ump) to the execution address of the program (provided you know it!). This does NOT work with S-BASIC, which seems to be utterly confused by this process.

It seems that none of these problems arise in MZ-700 K&P DBASIC. In all cases that I have tried (including S-BASIC with its own RAM Monitor), the m/c file has 'RUN' successfully off disk.

GETTING BACK TO A DISK BASIC

When a m/c program is loaded above a disk Basic, that Basic has not been overwritten, and you may want to get back to it without destroying the m/c program e.g. if you have loaded a disassembler to make several changes to a disk Basic, testing them as you go.

With K&P DBASIC the process is easy - if the m/c program sits above the end of any Basic program, Basic and its program both remain intact. In that case CTRL+RESET will return to both. If the source program has been overwritten, CTRL+RESET must be followed by NEW, to reset the Basic pointers. In all cases, you should also do a LIMIT, to stop Basic from encroaching into the m/c area.

With all the Sharp disk Basics, any Basic Source program will have been overwritten. The only way get back into a 'clean' Basic and keep the m/c program intact, is to jump to a WARM START and then do NEW (you can do both at once on the MZ-80K/B/A, by jumping straight to NEW). As before, you should also do a LIMIT:-

DISK BASIC	SP-6015	SA-6510	SB-6510	2Z-009E	K&P DBASIC
WARM START	$2245	$1300	$1280	CTRL+RESET	CTRL+RESET
'NEW'	$131F	$1E1B	$1DCF	N.A.	N.A.

Our fourth success was to use the 'NEW' trick to restore the integrity of MZ-80B disk Basic after we had RUN 'Commander'.

SUMMARY

With 'true' Sharp disk Basics, loading a m/c program off disk involves a process which destroys any Basic source file and limits the filesize of the program being loaded; in isolated cases it may even self-destruct. On the MZ-700, there may be Monitor problems. With care, you can recover the Basic, if it is not overwritten.

With K&P's MZ-700 DBASIC there are no problems. A m/c program is loaded straight into its specified location, and the ROM Monitor is switched in so the program should run. You can return to Basic, and the source file as well, if they have not been overwritten.

The limitations on m/c filesizes are (I think) as follows:-

MACHINE	METHOD OF LOADING	FILESIZE LIMIT
MZ-80K/A/700	Off tape via ROM Monitor	$BE00
MZ-80B	Off tape via IPL	$8000
MZ-80K	Off disk via SP-6015	$68D2
MZ-80B	Off disk via SB-7510	$98A4
MZ-80A	Off disk via SA-6510	$68A4
MZ-700	Off disk via 2Z-009E	$79EB
MZ-700	Off disk via K&P DBASIC	$BE00

The information in this article has been tested in many ways, but I may well have missed a trick, so if anyone has further information, I would be very pleased to hear it.

At least we can see why some files sometimes refuse to load or run. We also know how to transfer a very large file to a K&P disk, and know why it will 'RUN' from there. Finally, we have corrected a long-standing SB-6510 bug, and can at last RUN Knight's MZ-80B 'Commander' toolkit off disk; not bad for a bunch of amateurs! **

HUCALC+ HITS THE CHARTS by Maurice Hawes

In August 1992 I received a copy of Kuma's MZ-700 HUCALC, with its original 48-page Kuma Manual. This version of HUCALC is much better than the programs which have been in the MZ-80K/80A/700 Libraries until now; the Kuma MZ-700 version does NOT suppress trailing zeroes after the decimal point, and columns therefore remain lined up on the decimal point, whatever the decimal format.

However, the Kuma Manual is badly laid out, and very difficult to understand, so I started a 'cut and paste' job to make it more readable. Then, as I was running Kuma's MZ-700 program to check a few points, it hit me - the program uses the 700 ROM Monitor, so it should be possible to modify it to run on the MZ-80K/MZ-80A, and thus provide those machines with correct column alignment.

From then on, the project grew wings. First, I corrected the HELP screen in the Kuma MZ-700 version, and added code to allow it to be dumped to a Sharp printer; then I developed an alternative printer routine, to suit a modern 'Centronics' printer. Next, I transferred both new MZ-700 versions to the MZ-80K, and got them running there; and finally, I repeated the process on the MZ-80A.

John Ibberson's HUCALC 80B keeps the decimal point lined up, so it was not essential to produce new versions; but I decided to provide it with a 'HELP' screen dump and an alternative printer routine, to bring the MZ-80B into line with the other machines.

In the end, I had eight new HUCALC+ programs; all of them keep the decimal point lined up, and all have a 'HELP' screen dump:-

HUCALC700+/S and HUCALC700+/M.
HUCALC80K+/S and HUCALC80K+/M
HUCALC80A+/S AND HUCALC80A+/M.
HUCALC80B+/S and HUCALC80B+/M.

I then went back to editing the Kuma MZ-700 Manual, and made it suitable for all the new versions, by extending it to 56 pages.

LOADING HUCALC+

On the MZ-80K/A/700, the HUCALC+ master tape loads from the ROM Monitor in the usual way. On the MZ-80B the tape loads from IPL.

For those with disks, HUCALC+ may be put on a Basic master disk; from there, it will load in seconds. (HUCALC+ can only save data to tape, but loading off disk is worth-while because the program is $4A00 bytes on the K/A/700, and $6000 bytes on the MZ-80B).

HUCALC+ HARD COPY FACILITIES

The 'HELP' screen is dumped to the printer by the '$' key, and any other screen is dumped by 'command key + $'. Unfortunately, there is no direct command to send undisplayed sections of the matrix to the printer; but, using POUT, you can write a Macro to do the job, tailored to your own needs. The new Manual, which contains several Macro examples, should help you to do this.

(continued on next page)

DIFFERENCES BETWEEN THE VERSIONS OF HUCALC+

On the MZ-80K and MZ-700, the 'Command' key is BREAK.
On the MZ-80A, the 'Command' key is '00'.
On the MZ-80B, the 'Command' key is 'SFTLOCK'

On the MZ-80K and MZ-700, 'pi' returns to the Monitor.
On the MZ-80A, to return to the Monitor, press GRPH then 'pi'.
On the MZ-80B, there is NO way of returning to the (RAM) Monitor.

On the MZ-80K/A/700 the display is in 40 columns. Several lines at the top are reserved for input, leaving 17 lines for the matrix.

On the MZ-80B, the display is in 80 columns; so fewer lines at the top are reserved for input, and 20 lines are left for the matrix.

On the MZ-80B, FOUR of the general commands use letters which are different from those on the other three machines (Z,Q,S,T on the MZ-80B are equivalent to C,H,K,L on the other machines).

On the MZ-80B, SFTLOCK+F resets the d.p. only in cells AT or BELOW the cursor; the 'PROTECT' sign is a 'heart' (instead of 'P'); the UNPROTECT sign is a 'spade' (instead of 'U'); and the AUTO-CALC direction arrow points RIGHT or DOWN (instead of LEFT or UP).

FUNCTION KEYS (MZ-80B and MZ-700 ONLY)

On the MZ-80B, the 10 function keys are defined as follows:-

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
ELSE	INPUT	SWAP	THEN	STOP	MEAN(	SUM(	MAX(	MIN(	COUNT(

On the MZ-700, the function keys are defined as above, with F6-F10 being accessed via SHIFTED F1-F5, respectively.

PRINTER OPERATION

/S versions retain the original Hudsonsoft printer routines, for Sharp printers; therefore, on the MZ-80K/A/700, $0D is sent to the printer at the end of each line; but on the MZ-80B, it is $0A.

/M versions contain modified printer routines. On all machines, the second call to PTEST is cut out, and the routine sends $0A at the end of each line, and standard ASCII lower-case codes.

If the printer is not ready, beeps are given at intervals of a few seconds. In the /S versions on the K/A/700, control returns to the user after 4 beeps. In all other versions the beeps continue until the printer is ready to print, or the computer is switched off.

OBTAINING HUCALC+ AND THE NEW HUCALC+ MANUAL

It is possible to use most of HUCALC+ from the information given in Vol.12 No.2; for this reason, all eight programs have been put in the normal Libraries; the decision was made just before we went to press, but by now the tapes are with your particular Librarian.

However, to exploit HUCALC+ to the full, especially its MACRO capabilities, you may need the new Manual; on account of its size, this is ONLY available from M.H. in Weymouth, £5-00 post free. ***

Sharp Printers - by Maurice Hawes

The article by W. Blankley, in this issue, makes me think that if Sharp printers are going for peanuts we should not ignore them. This review reminds us of their features (excluding the MZ-700 plotter/printer, adequately covered in the 700 Owner's Manual).

MZ-80P3

This was the 'dedicated' printer for the MZ-80K. The printhead has only 7 pins, and its one and only character font (in 2 sizes) therefore lacks descenders. The P3 has tractor drive only, and one control button (LINE FEED). Furthermore, it has only 1 form length setting, 66 lines, so you are effectively limited to using 66-line 'standard' continuous listing paper.

The P3 has no external signal connector on its casing; instead, it has a built-in flying ribbon lead with a 26-way DIL socket on its free (computer) end, to match the plug on the standard MZ-80K printer card. Its character set includes Sharp lower-case and most MZ-80K graphics; printing occurs on receipt of $0D, after which the P3 does AUTO LF. The P3 will run on the MZ-80A/700 (with a few wrong graphics) by changing the connector on the end of the lead.

With all its limitations, the P3 is a real work-horse; it prints quite fast, and uses standard typewriter ribbons which are cheap, last a long time, and can be turned over to extend their life. In other words, the P3 is very adequate for run-of-the mill listings, and I have one more or less permanently connected to my MZ-80K.

The SUC can supply a replacment character eprom which gives a better character font, including much-improved letters g, p, q, and y, with descenders. This costs £5-00 from you-know-who.

MZ-80P4

This is a strange animal. It is a very large machine, obviously meant for business use, with a 15" carriage, friction and tractor feeds, and 3 control buttons (ON-LINE, LINE FEED, and FORM FEED). Its head has 9 pins, and its character font (4 sizes) has true descenders. The P4 has 14 internal DIP switches (see 'DIP switch' article in this issue), battery-backed memory for form length, and a 36-way Centronics-type socket (but for protocol, see below!).

The P4 may be 'customised' to suit the MZ-80K, the MZ-80B or the MZ-80A, by fitting an appropriate set of 3 eproms; a set of eproms is mounted on a separate plug-in PCB-carriage, easily changed via a small panel at the front of the machine. The K/B/A eprom sets are referred to as MZ-8KP4R, MZ-8BP4R and MZ-8AP4R respectively, and with one of these eprom sets fitted, the 36-way pinout is to 'Sharp' signal protocol, as on other MZ-80P printers!

Those not familiar with the idiosyncracies of the various Sharp computers should know that when 'customised' for the MZ-80K/A the P4 has a 'Sharp' lower-case character set, and printing occurs on receipt of $0D, after which there is an AUTO LF. But when the P4 is 'customised' for the MZ-80B, it has a standard ASCII lower-case character set, and it may be set to print on receipt of either $0A or $0D, depending on the AUTO LF setting (DIP switch 2-2).

(MZ-80P4 continued)

There is no MZ-700 eprom set for the P4, but the MZ-80A set is very suitable; only 2 characters are different (at $6C and $7F).

The P4 Manual mentions another eprom set, MZ-8SP4R, which I have never seen. It sets up the machine as 'Pseudo-Centronics', and it provides selectable character sets (ASCII, French, German, Danish, Swedish, Italian, Spanish), and a true 'Centronics' interface.

With ALL eprom sets, the MZ-80P4 can be software-set to any form length between 1 and 72 lines, and can do bit-image printing; and with the 'B' and Centronics sets only, it can do tabulation.

The numbers on the P4 eprom sets that I have seen, viewed on the parts side of the PCB when it is out of the machine, are:-

MZ-8BP4R	32 31 30)	I have all these sets and can arrange
MZ-8KP4R	35 34 33)	for them to be copied if required.
MZ-8AP4R	38 37 36)	

From the above, I would guess that the 'MZ-8SP4R' eproms may be numbered 41 40 39, but I could be wrong! I would be VERY grateful if anyone could turn up an MZ-8SP4R set to check this, and EVEN MORE GRATEFUL if I could borrow the set to copy, for the Club!

MZ-80P5

There are at least two versions of this printer, with different main PCB's. In the 'early' P5, the main chips have their long axes running front to back (see Service Manual PDSM281007-MZ); in the later P5, the main chips have their long axes running from left to right (see Service Manual 00ZMZ80P5111J). The two models do not behave the same; for example, the 'early' version gives problems with versions of WDPRO after 2.25, but the other does not. A more detailed discussion of the differences appears in Vol.8 No.2.

The Service Manual for the 'early' P5 refers specifically to control codes peculiar to the MZ-80B. It therefore seems likely that this version was meant to be used only with that machine.

However, all P5's have a 9-pin head; a 10" carriage WITH TRACTOR FEED ONLY; a single font, with descenders, in 4 sizes; two control buttons (LINE FEED and FORM FEED); and a 25-way D-type external signal connector which conforms to Sharp MZ-80K/B/A/700 protocol. The P5 ribbon is the same as that on early Epson printers such as the MX-80, RX-80, and FX-80, and is therefore widely available.

The 'later' P5 may be 'customised' for the MZ-80K, the MZ-80B or the MZ-80A, by changing just one eprom (IC16). The procedure is tedious, as the cover has to be removed to get at the chip. With the MZ-80K/A chips the printer has a Sharp lower-case set, prints on receipt of $0D, and does an AUTO LF. With the MZ-80B chip the lower-case set is standard ASCII, and by default printing occurs on receipt of $0A (but $0D is software-selectable if required).

There is no MZ-700 chip, but the MZ-80A chip may be used. I have all 3 eproms (MZ-8KP5R, MZ-8BP5R, MZ-8AP5R) and can supply copies.

(MZ-80P6 and multiple eprom, see over)

MZ-80P6

The P6 has tractor AND friction feed options, and has 3 control buttons (LINE FEED, FORM FEED, ON/OFF LINE). In other respects the P6 resembles the later P5, and is 'customised' by changing IC16.

THE SUC MULTIPLE EPROM FOR THE P5/P6

John Edwards has produced a multiple eprom for the later P5 and the P6. It offers four eproms, selectable by a switch (MZ-8KP5R, MZ-8AP5R, MZ-8BP5R, and a modified MZ-80BP5R with the proper ASCII $5F 'underline' character in place of the 'YEN' sign, at $91).

CE-332P

This was the dedicated printer for the PC-3201 (Sharp's first 'business' machine, produced in 1981, based on the Z80 chip, and in NO WAY IBM-comptatible). The CE-332P is another strange animal; the cover of the Users Handbook describes it as a serial printer, but I am reliably informed by a member who has one that it has a standard 36-way 'Centronics' interface; and the Service Manual for the PC-3201 shows details of its built-in 40-pin DIL printer port, which is to Centronics protocol, but with a non-standard pinout.

The instructions for the CE-332P, and its photo on the cover of the Users Handbook, show that it is based on the Epson MX-80. But it is fitted with special eproms to give it a most extraordinary mode of operation, and an extended 'standard ASCII' character set.

In brief, the character set has graphics at positions $01 - $1F, except for $0A, which prints a line and does a line feed. However, $0E has an alternative function; when FIRST on a line it invokes enlarged character mode. Also, $1D and $1E have NO effect if first on a line, and $1F has an alternative function (see below).

From $20 to $7F the character set is virtually 'standard ASCII'; the 2 exceptions are $5C ('YEN' sign) and $7F (3 vertical bars). Above that, $80-$FF give mixed graphics/Japanese characters, and $FC has an alternative function (see below).

In other words, the only single control codes recognised by the CE-332P are $0A, and $0E if it is first on a line. Other control codes must be in multiple sequences which MUST start with $FC, and MUST end with $1F. For example, a CARRIAGE RETURN is <$FC $0D $1F> and ESC "2" is <$FC $1B $32 $1F> !!!

Space forbids a long discussion; enlarged/condensed characters, 1/8" line spacing, form feeds, incremental LF's, and bit-image are all possible using the $FC....$1F technique. In short, the CE-332P may be used as a 'standard ASCII' printer, but not by one who is faint-hearted! I have further information, if you are interested.

MZ-1P02

I have never seen an MZ-1P02, recommended for Sharp MZ-3500/5600 computers. But I recently acquired an MZ-1P02 Service Manual, and this shows something looking remarkably like an OKI MICROLINE 82, fitted with both RS-232 and Centronics I/F's, and using standard typewriter-style ribbons. Can anyone enlighten us further ? ***

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Introduction and review

So here we are at Part 5 of our review of *Sharp* Basic. The Basic that I'm using is SP-5060, but whenever a facility is not available in SP-5025 I take care to point this out. Also, by way of comparision, there are occasional references to *Xtal 3.1* Basic; this is a little used Basic and the firm who supplied it, *Crystal*, appear to be out of business; however I hope that references to it help to show that there is considerable variation in the details of Basics, even when they are about the same size. Of course a Basic which takes up much more space, like *Hudson* 24K Basic, has many more facilities available. However I don't have personal experience of *Hudson* Basic. Some of my programs have been very large, so I've usually wanted to keep as much space free for the program as possible. *Xtal 3.1* Basic, leaves 33,300 free; that's impressive, as it is in some ways more powerful than SP-5060. The latter, at least in my version with an EPSON printer driver incorporated, leaves 31,870 bytes free. However SP-5060's function keys are a blessing, and it's a nice interpreter.

In the last issue we spent some time looking at **GOTO** and how to avoid it by using **FOR NEXT** loops. We saw one way of jumping out of a **FOR NEXT** loop, and how to **END** or **STOP** a program from executing. We learnt how to get our computer to know the time, by setting the value of **TI$**. We noted how to clear the Variables with **CLR** (as an alternative to using **RUN** *not* followed by a LINE number). We learnt how to delete lines and to protect a **DIM...( )** command from being executed twice. We finished with a promise to look at two dimension arrays; that's just what we'll do now.

Two dimension arrays

A single dimension array might be pictured as a stack of boxes one on top of another, each of which can be used to store a bit of information. A two dimension array can be seen as a whole wall covered with such boxes. However each box uses up a bit of wall space (or memory in the case of Basic), so we have to decide how many boxes we are going to need. For 2 dimension arrays we use the DIM...(y,x) command to designate the number of boxes required.

The sort of situation in which a 2 dimension array can be useful is that in which there is a different bit of data for each month of each year: in this case one dimension can be used for the year, and another dimension for each month. The usefulness of this is best seen by looking at an example. Anyhow it may be encouraging to see that confining ourselves mainly to the Basic commands we have already covered, it is already possible to do something useful. Thus in the LISTING overleaf we will show a program that can print out the Retail Price Indices for every month over a period of 43 years. The value of the RPI for each month has been entered as **DATA**. To save space only the first of the **DATA** LINES are shown in the LISTING.

It may occur to you that if the value of the RPIs has to be typed in as DATA, then the same result could be obtained with a word processor. However Retail Price Indices change their base from time to time. If the DATA is all held in a Basic program, then it only requires one small change to get the whole list recalculated and printed to the new base. That's better than doing the whole job again with a word processor! So let's now look at the LISTING, and then consider the program in detail. One command used in the program that we have not yet fully considered is **GOSUB**. **GOSUB** is a command that allows execution to leave the main program and go off to a subroutine - from whence it returns upon reaching the command **RETURN**. We will consider **GOSUB** in more detail in a later issue, but for now let's look at the LISTING, in conjunction with the output which appears over the next page.

```
100 DATA 1947,-1,-1,-1,-1,-1,29.13,29.42,29.13,29.42,29.42,30.00,30.29
110 DATA 1948,30.29,30.87,30.87,31.46,31.46,32.04,31.46,31.46,31.46
115 DATA 31.46,31.75,31.75
120 DATA 1949,31.75,31.75,31.75,31.75, 32.33,32.33,32.33,32.33,32.62,32.62
125 DATA 32.62,32.91



990 REM ************************************************************************
991 REM SP-5025/60 program for printing RPIs. File <RPI LIST/7>. 6.2.92.
992 REM DATE( ) holds each year, e.g. 1947,1948....
993 REM M is a flag.
994 REM P$( ) printer codes.
995 REM RPI(43,12) holds RPIs allows 43 years and 12 months.
996 REM Z is a counter.
997 REM ZZ is a counter.
999 REM ************************************************************************
1000 REM *** READ DATA ***
1010 IF M=0 THEN DIM RPI(45,12): DIM DATE(45): M=1
1020 FOR Z= 1 TO 45
1030 READ DATE(Z)
1040 FOR ZZ= 1 TO 12
1050 READ RPI(Z,ZZ)
1060 NEXT ZZ
1070 NEXT Z
2000 REM *** PRINT OUT ***
2010 GOSUB 61900: REM init. printer codes:PRINT/P P$(40);P$(3);P$(8):P$(18);
2020 PRINT/P"Year  Jan.  Feb.  Mar.  Apr.  May.  Jun.  Jul.  Aug.  ":
2030 PRINT/P"Sep.  Oct.  Nov.  Dec.";P$(19)
2040 FOR Z= 1 TO 45
2050 IF DATE(Z)/10 <> INT(DATE(Z)/10) THEN GOTO 2090
2060 PRINT/P P$(18);
2070 PRINT/P"Year  Jan.  Feb.  Mar.  Apr.  May.  Jun.  Jul.  Aug.  ";
2080 PRINT/P"Sep.  Oct.  Nov.  Dec.";P$(19)
2090 PRINT/P STR$(DATE(Z));" ";
2100 FOR ZZ= 1 TO 12
2110 RPI(Z,ZZ)= RPI(Z,ZZ)+.0001
2120 IF RPI(Z,ZZ) > 0 THEN GOTO 2140
2130 PRINT/P"      ";: GOTO 2150
2140 PRINT/P LEFT$(STR$(RPI(Z,ZZ)),5);" ";
2150 NEXT ZZ
2160 PRINT/P
2170 NEXT Z
9999 END
```

Looking at LINE 100, note that there was no information available for the first 5 months of year 1947. The easiest method of getting the program to recognize this was to use a negative number; in which case LINE 2130 is used to print a blank space.

The main program starts at LINE 1000, so it would be sensible to have a first LINE of this program: **GOTO 1000**. LINES 991-997, before the main program, give the sort of information which is so easily lost or forgotten over a period of years; also it is much easier to understand a program if there's a list of the Variables used.

The essential structure of the program is very simple. Firstly the **DATA** has to be read into the array, and then it has to be printed out. This distinction is made clear not only by the **REM** LINES 1000 and 2000, but also by starting the first section of the program with LINE numbers in the 1000 range and the second part of the program with LINE numbers in the 2000 range.

Note that between LINES 1020-1070 we have one **FOR NEXT** loop nested within another. When the inner loop starts, at LINE 1040, it is executed 12 times before the program proceeds to LINE 1070. Thus the RPI values for all 12 months are read into the array. The 2 dimension array can be seen as a convenience.

Printer codes are long series of 'meaningless' characters which have to be sent to the printer in order to switch on such things as underline. A word processor may do this for you without you having to know anything about the required printer codes. However not so with the *Sharp* Basic printer driver. Perhaps the easiest way to deal with these codes is to store them in an array. Then a particular element of the array can be sent to the printer instead of typing out all the code. e.g. in LINE 2060 P$(18) is sent to the printer to switch on underline. The complete P$( ) array is filled with the required printer codes by the **GOSUB** routine at LINE 61900, the routine is called in LINE 2010. Of course P$(40), P$(3) etc. are all specific to my particular 61900 subroutine, and I keep a hardcopy list of what each one represents.

LINE 2050 is a good illustration of the tendency to need to use GOTO in *Sharp* Basic because there's no **IF... ENDIF** command. Note too how the **INT( )** function can be used to identify specific intervals: in this case years which are divisible by 10.

In order to get output sent to the printer in SP-5025/60, we use the command **PRINT/P**. This is a rather poor way of controlling output. In SP-5025.K2, after a **PRINT/A** command has been executed *all* the following **PRINT** statements in the program (either **PRINT** or **PRINT/P**) will go to both printer and screen. We will be looking at SP-5025.K2 in detail in a later issue.

Dates are stored as numbers, but a function that we haven't met yet, **STR$( )** is employed, in LINE 2090, to turn the number into a string. Why is this? In order to eliminate the unwanted leading space which is printed before a number.

And why, in LINE 2110, do we add .0001 to the RPI? So that the string is always long enough to slice up, as is done in LINE 2140. That's where we must leave our observations on the program. On the next page we see what happens when we RUN it:

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1947						29.13	29.42	29.13	29.42	29.42	30.00	30.29
1948	30.29	30.87	30.87	31.46	31.46	32.04	31.46	31.46	31.46	31.46	31.75	31.75
1949	31.75	31.75	31.75	31.75	32.33	32.33	32.33	32.33	32.62	32.62	32.62	32.91
Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1950	32.91	32.91	32.91	33.20	33.20	33.20	33.20	32.91	33.20	33.49	33.79	33.79
1951	34.08	34.37	34.66	35.24	36.12	36.41	36.70	36.99	37.28	37.57	37.57	37.86
1952	38.45	38.74	38.74	39.32	39.32	40.19	40.19	39.90	39.61	40.19	40.19	40.19
1953	40.19	40.48	40.78	41.07	40.78	41.07	41.07	40.78	40.78	40.78	40.78	40.78
1954	40.78	40.78	41.07	41.36	41.07	41.36	42.23	41.94	41.65	41.94	42.23	42.23
1955	42.52	42.52	42.52	42.81	42.81	43.69	43.69	43.40	43.69	44.27	44.85	44.85
1956	44.56	44.56	45.01	45.90	45.90	45.45	45.45	45.45	45.45	45.90	45.90	45.90
1957	46.34	46.34	46.34	46.34	46.79	47.24	47.70	47.24	47.24	47.68	48.13	48.13
1958	48.13	48.13	48.13	49.02	48.57	49.02	49.57	48.13	48.13	48.57	49.02	49.02
1959	49.02	49.02	49.02	49.02	48.57	48.57	48.57	48.57	48.57	48.57	49.02	49.02
Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1960	49.02	49.02	49.02	49.02	49.02	49.50	49.45	49.02	49.02	49.46	49.91	49.91
1961	49.91	49.91	50.36	50.36	50.80	51.25	51.25	51.69	51.25	51.69	52.14	52.14
1962	52.14	52.19	52.40	53.13	53.28	53.65	53.44	52.97	52.97	52.87	53.08	53.34
1963	53.55	54.01	54.07	54.22	54.17	54.17	53.87	53.79	53.86	54.07	54.22	54.33
1964	54.59	54.64	54.85	55.32	55.79	56.00	56.00	56.20	56.20	56.26	56.70	57.30
1965	57.09	57.09	57.30	58.39	58.60	58.76	58.76	58.86	58.72	58.97	59.23	59.49
1966	59.59	59.65	59.75	60.48	60.90	61.05	60.79	61.16	61.05	61.21	61.57	61.68
1967	61.78	61.84	61.84	62.30	62.25	62.51	62.15	61.99	61.94	62.41	62.77	63.19
1968	63.40	63.71	63.92	65.07	65.12	65.38	65.43	65.54	65.59	65.90	66.06	66.94
1969	67.31	67.67	67.94	68.67	68.56	68.87	68.87	68.72	68.93	69.49	69.60	70.07
Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1970	70.65	71.01	71.43	72.52	72.73	72.94	73.46	73.41	73.77	74.56	75.05	75.60
1971	76.64	77.06	77.69	79.35	79.87	80.45	80.92	80.97	81.07	81.54	82.01	82.43
1972	82.90	83.32	83.58	84.34	84.78	85.35	85.61	86.29	86.76	87.96	88.27	88.74
1973	89.31	89.89	90.41	92.13	92.80	93.27	93.69	93.95	94.79	96.66	97.39	98.12
1974	100.0	101.7	102.6	106.1	107.6	108.7	109.7	109.8	111.0	113.2	115.2	116.9
1975	119.9	121.9	124.3	129.1	134.5	137.1	138.5	139.3	140.5	142.5	144.2	146.0
1976	147.9	149.8	150.6	153.5	155.2	156.0	156.3	158.5	160.6	163.5	165.8	168.0
1977	172.4	174.1	175.8	180.3	181.7	183.6	183.8	184.7	185.7	186.5	187.4	188.4
1978	189.5	190.6	191.8	194.6	195.7	197.2	198.1	199.4	200.2	201.1	202.5	204.2
1979	207.2	208.9	210.6	214.2	215.9	219.6	229.1	230.9	233.2	235.6	237.7	239.4
Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1980	245.3	248.8	252.2	260.8	263.2	265.7	267.9	268.5	270.2	271.9	274.1	275.6
1981	277.3	279.8	284.0	292.2	294.1	295.8	297.1	299.3	301.0	303.7	306.9	308.8
1982	310.6	310.7	313.4	319.7	322.0	322.9	323.0	323.1	322.9	324.5	326.1	325.5
1983	325.9	327.3	327.9	332.5	333.9	334.7	336.5	338.0	339.5	340.7	341.9	342.8
1984	342.6	344.0	345.1	349.7	351.0	351.9	351.5	354.8	355.5	357.7	358.8	358.5
1985	359.8	362.7	366.1	373.9	375.6	376.4	375.7	376.7	376.5	377.1	378.4	378.9
1986	379.9	381.1	381.6	385.3	386.0	385.8	384.7	385.9	378.8	388.4	391.7	393.0
1987	394.5	396.1	396.9	401.6	402.0	402.0	401.6	402.8	404.0	405.9	407.9	407.5
1988	407.5	409.1	410.7	417.4	419.0	420.5	420.9	425.7	427.6	432.0	433.9	435.1
1989	437.9	441.1	443.0	450.9	453.7	455.3	455.6	456.8	460.0	463.5	467.5	468.7
Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1990	471.4	474.2	478.9	493.5	497.9	499.8	500.2	505.4	510.1	514.0	512.8	512.5
1991	513.6	516.4	518.4	525.1	526.7	529.0	527.8	529.0	531.0	533.0	534.9	535.3

Retail Price Indices, with a base of January 1974=100, from the time when the Index started in June 1947. Note that the Index was rebased, yet again, in January 1987, when the index stood at 394.5 (with a January 1974=100 base). Thus to convert all these figures to a January 1987 base they need to be divided by 3.945: easy with a computer! £1 in Jun 47 was worth 535.3/29.13 = £18.38 in terms of the value of pounds in December 1991. **

PRINTER DIP SWITCHES by Maurice Hawes

A few years ago, Epson made a determined effort to establish their own printer control codes as the 'industry standard' for dot-matrix printers, and they largely succeeded - most dot-matrix printers from the middle 1980's used FX-80 printer ESC codes, and the term 'Epson-compatible' was, and still is, in common use.

One might therefore assume that the DIP switch settings in such printers would also be compatible. But that is not the case, even with Epson's own printers! Their MX/RX/FX-80 printers all have 2 banks of DIP switches, one bank of 4 and one bank of 8, but there the similarity ends, as you can see from the following table:-

SW.	MX-80 (OFF/ON)	RX-80 (OFF/ON)	FX-80 (OFF/ON)
1-1	Lines/inch 6/8	Columns 80/132	Columns 80/132
1-2	Form length 66/72	$80-$9F CTRL/grph	ZERO slash OFF/ON
1-3	Default style 1	Cut sheet OFF/ON	PE detector ON/OFF
1-4	Default style 2	Form length 66/72	UCG RAM/Buffer RAM
1-5	ZERO slash OFF/ON	PE detector ON/OFF	Default norm/emph.
1-6	PE detector ON/OFF	Int-Char-Set 1	Int-Char-Set 1
1-7	Int-Char-Set 1	Int-Char-Set 2	Int-Char-Set 2
1-8	SLCT IN OFF/ON	Int-Char-Set 3	Int-Char-Set 3
2-1	Int-Char-Set 2	ZERO slash OFF/ON	SLCT IN OFF/ON
2-2	Int-Char-Set 3	SLCT IN OFF/ON	Buzzer OFF/ON
2-3	AUTO LF OFF/ON	AUTO LF OFF/ON	1" skipover OFF/ON
2-4	1" skipover OFF/ON	1" skipover OFF/ON	AUTO LF OFF/ON

Clearly there is NO Epson standard for DIP switch settings; so I tried other printers, including the Sharp MZ-80P4 with various ROM sets (as discussed in my 'Sharp Printers' article in this issue):-

SW.	STAR LC-10 (OFF/ON)	MZ-80P4K/A (OFF/ON)	MZ-80P4B/S (OFF/ON)
1-1	Form Length 72/66	Form Length 72/66	Form length 72/66
1-2	AUTO CR OFF/ON	Lines/inch 3/6	Lines/inch 3/6
1-3	'Orator' l.c./caps	ZERO slash ON/OFF	ZERO slash ON/OFF
1-4	Sheet feed ON/OFF	Default OFF/ONline	Default OFF/ONline
1-5	PE Detector OFF/ON	Columns 160/136	Columns 160/136
1-6	IBM/Standard mode	Memory OFF/ON	Memory OFF/ON
1-7	Grph/Ital//#1/#2	----------	----------
1-8	AUTO LF ON/OFF	----------	----------
2-1	UCG RAM/Buffer RAM	Buf-full LF ON/OFF	Buf-full LF ON/OFF
2-2	Int-Char-Set 1	PE detector OFF/ON	AUTO LF ON/OFF
2-3	Int-Char-Set 2	No Action	DC1/DC3
2-4	Int-Char-Set 3	* These 4 switches have no action when	
2-5	----------	* K/B/A ROM sets are fitted to the P4.	
2-6	----------	* When the 'S' ROM set is fitted they	
2-7	----------	* select ASCII/Fr/Ger/Dan/Swe/Ital/Spa	
2-8	----------	Automatic wait **	Automatic wait **

** On the MZ-80P4, SW 2-8 ON slows down the printer under heavy loads (e.g. heavy bit-image printing), to stop head overheating.

The moral is, if you don't have a Manual, don't assume anything! But from the above, you can see what sort of things DIP switches do, so with patience, trial and error, you might find out.....***

Edited by Maurice Hawes
in Weymouth

MZ80K News

HUCALC+ for the MZ-80K

In the general section of this issue I tell of HUCALC+ for all the early MZ- machines. Here, I merely remind you the 'K' versions are in the Library, though they arrived too late for mention by Tony Clarke in his Library News. HUCALC+ commands are virtually identical to those in HUCALC (see Vol.12 No.2), but if you wish to exploit HUCALC+ to the full you should get the new HUCALC+ Manual, 56 pages, obtainable from me for £5-00 post free (payable to SUC).

MZ-80K HI-RES/SPEECH SYNTHESISER/REPAIRS

Tony Kemp is very familiar with MZ-80K Hi-Res. He was one of the first to buy Quantum Hi-Res in the early 80's, and later designed his own more flexible version. He has now upgraded his own version using modern chips, to add 32K of 'graphics' RAM, and will supply it to members at cost, with software. He can also supply a speech synthesiser with software, and will have a go at repairing K's, including those with Hi-res. Telephone 0623 743434 (Mansfield).

SDOS and ZEN DOS

Old hands will know that Dr. Brian Gladman wrote two special disk operating systems for the MZ-80K, one for his disk version of MZ-80K WDPRO, and one for his disk version of the ZEN assembler.

The WDPRO DOS system announces itself as <SDOS 1.00>, whereas the ZEN DOS system announces itself as <* DOS v1.00 *>. This similarity is very misleading, as the systems are very different.

I have never unravelled the history of the two systems, but I am pretty sure that WDPRO DOS, usually referred by its sign-on name of 'SDOS', is the earlier of the two. Its documentation occupies only 2 pages of the disk WDPRO Manual, and gives no guide to the structure of the system or the meaning of error numbers. SDOS is in one 'hidden' file on a master disk, and in RAM it occupies $BD00 - $CCEF (and uses the area up to $CFFF as a work area)

ZEN DOS is usually referred to as such, and its Manual occupies most of the 11 pages that come with the disk version of ZEN (the Assembler itself is based on the tape version, and needs little further explanation). The Manual gives the structure of ZEN DOS, the addresses of many important routines, and an explanation of the error numbers. The files on a ZEN DOS master disk include five system files, all visible, and named #0 to #4. Of these, #0 is the main file, occupying $C000 - $C9FF; the other 4 are smaller files which are loaded as needed, as 'overlays', at $CA00. The remaining files on the disk (ZEN, COPY and LIST) are separate programs and not part of ZEN DOS (a ZEN DOS directory listing is comprehensive, and shows that ZEN, COPY and LIST all load at $1200). The built-in ZEN DOS commands are split between the system files as follows:-

#0 - BYE, ENT, GOTO, DRIVE, PRON, PROFF, LOAD, RUN
#1 - DELETE, LOCK, UNLOCK, SAVE, REPLACE, RENAME
#2 - DIR, SECT
#3 - MOVE, INPUT, OUTPUT
#4 - PUT, INIT, PRINT

SOUND ON LOAD : Hear tapes loading by pressing either shift key. (Also cuts out tape-consuming second save).

MID$ mod. : See "SHARP BASIC INSIDE & OUT" Pages 108 to 109

ROPEN mod. : Adds "press key prompts" (See Peeking/Poking).

Halt LIST : Improved listing control.

AND OR NOT : No need to use brackets (the conventional * - + with brackets still work).

DELETIONS

JOY, MODE, SKIP, LINE, RLINE, MOVE, RMOVE, PCOLOR, PHOME, HSET, GPRINT, AXIS, CIRCLE, TEST AND PAGE ETC.

SPARE AREA

$4E11-$4F11 (257 bytes). The unused CIRCLE command may be changed to a new 6-letter command if required; the unused keyword is at $2E1A and its address, in the keyword address table, is at $3029.

****

MZ-1R12 EXTENSION RAM by Paul Trainer

This is an extension RAM board designed to sit inside the expansion box MZ-1U06 and used by the 700. It can be used for BOOTing S-BASIC or other MC programs at switch-on or as a 32K of external memory device (used like a small capacity disk drive).

The CMOS STATIC RAM (S-RAM) is battery powered, so its contents will not be lost when the 700 is switched off. The board's specification is as follows:-

MEMORY CAPACITY	32k bytes
ROM	4k bytes
Data Preservation time	Approx. 1.5 months (with battery charged at 150%)
Charging time	100% 29 hours 150% 43 hours
Power supply	5V DC +/- 10%
Devices	CMOS STATIC RAM (2k bytes) x16

The small manual enclosed with the board gives full instructions of its uses including a BASIC program which lets the user keep track of all his telephone numbers and keeps them securely held on the S-RAM. Full details are also given of how to transfer S-BASIC etc. to the S-RAM. It really is a doddle even for me. I successfully managed to transfer all manner of MC stuff to the chips and then loaded the programs instantly at switch-on.

Continued on next page.

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MZ-80K LIBRARY

When I introduced myself in Vol.12 No.1, I forgot to tell you that I am completely lost on machine code; so it really is a waste of time asking me questions about it on the 'phone. Which reminds me to remind you - please ring at weekends only, as I have a funny shift pattern; some of you know this already, so I'll say no more.

Without doubt, the Library owes its survival to Alan Bunting; without all his hard work, it would not be in the position that it is today. But to suit my own method of working I am in the process of re-arranging the disk Library, ready for Vol.13 No.1; in that issue, the 1993 disk Library list will be under 4 headings:-

1. GAMES
2. LANGUAGES & UTILITIES
3. BUSINESS PROGRAMS
4. SPECIALS (HIRES, JOYSTICK etc.)

Tony Kemp has recently donated several disks, mostly written by himself; 4 in (ZEN)DOS format, 3 in standard disk Basic, and 1 disk of tape games. They will all be listed in Vol.13 No.1, but if you are keen to find out about them before then, send me an S.A.E.

ZEN DOS is discussed elsewhere in this section, so I will just emphasise one point - if you need a (ZEN)DOS master, please send an EXTRA disk. I must add that MORIS-MINER (a program on one of Tony's DOS disks, written in 1988) is so addictive that I've had to hide it to write this; it has superb graphics and sound, with 6 screens, and is a must for games freaks. Many thanks, Tony!

And now I have two requests:

1. Can any one out there supply me with a way of transferring BSD files from disk to tape ?? (I am transferring most of the 80K Library to MZ-700/800 format (very SLOWLY!!) so that more people can use it. I have many good games and business programs that use data files, and the 80K can not copy BSD files from disk to tape.)

2. When sending in disks or tapes, please use good quality media, no rubbish, it's worth it, as you may otherwise lose the programs later on. Also, - I'm nosey, and like to see what's going on, SO please send me disks with something on them, not just blank disks (after all, I can only expand the Library with your help). And please remember - formatted disks only, enough 1st class stamps for copying charges; AND the return postage and address label.

ENDPIECE

I have just received the tapes of HUCALC80K+ (/S and /M) from Maurice. They are on tape volume 72, and new disk volume B/E 6.

Last of all, I strongly recommend that members who do not have disk drives should take up the Club offer of cheap I/O boxes with interface cards, mentioned elsewhere in this issue. Once you have disks you will wonder how you ever survived without them!

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MZ80A News

EDITORIAL

Once again my trusty MZ-80A has not seen much action. In the last issue I promised I would have E-Mail installed by now, but it has turned out to be only today, the day of deadline for SUC copy, that my comms man and I settled down to the task. And what a mess we got into! Still, it will all get sorted on Monday... I hope.

CASH FLOW BUG

It's confession time again. This time I've got to report that earlier this year I finally got round to transferring my Home Budget data onto a spreadheet on my PC-2286. That, however, is not the confession! I couldn't reconcile the figures from the SHARP CASH FLOW program. Then I discovered it! A bug!

It was quite a surprise to find it. I don't know how many members use the CASH FLOW program but none have complained to me, but then nor has my wife and she's been supplying her boss's bank manager with reports for the last three years and he hasn't complained either.

The problem appears on the monthly reports, the balance for "Last Year - Cumulative". Everything is fine in the first year of operation. The trouble was in the Year End procedures. This failed to make the appropriate transfer in the main array for the "Last Year" figures. Line 3020 should have concluded with the following statements:

```
3020 ..... :L(0,52)=L(12,52):FORM=1TO12
```

Line number 3020 occurs only in the tape version of CASH FLOW, and in the CFLOWUTIL module of the disk version. I have now updated both versions (tape and disk), and by the time you read this they will be in the Library, together with a revised manual. The latest versions of the disk suite are now REMed as follows:

CFLOWINIT v2.1	February 1990
CFLOWMAIN	December 1989
CFLOWUTIL v2.2	May 1992

and the tape program:

CASH FLOW v2.2	May 1992

'HUCALC+' - A BETTER WAY?

I have just received a copy of the new HUCALC+ spreadsheet, reported in detail elsewhere in this issue. I haven't yet had time to test its capabilities, but I wonder if it could be a better tool than my old CASH FLOW. Just think, I might never have written CASH FLOW if I had had a spreadsheet at the time! ***

MZ-80B Sub-Editor
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MZ80B News

As you can see, I have moved; not far, I still have a Sheffield post-code, but please note that MY TELEPHONE NUMBER HAS CHANGED. It all happened recently and I am still settling in, so please bear with me if your letters don't get answered straight away.

Not a lot has happened on my computer front recently, but I did recently receive one very interesting 'phone call asking for help, from Imperial College in London. They are still using an MZ-80B to run a research program which was written on the machine many years ago, and the machine had broken down. I am happy to say that I was able to help them - quite a feather in't' cap for the SUC!

I have heard from John Ibberson and Maurice Hawes, concerning their midnight-oil efforts to sort out the 'RUN' bug in SB-6510, in time for this issue. I gather that they have been successful, and that the Library article in this section tells you all about the new SB-7510, so I will say no more on that particular point.

However, John Ibberson has asked me to tell you that he has also produced a new version of the TAPE Basic SB-5510, which includes Josef Riha's full repeating keyboard, and the command CLS to clear the screen. This new tape Basic is called SB-5510 v2, available from John by sending him the usual blank tape and return postage.

Another thing John asked me to mention is that the CLS command replaces 'LET' - so if you use SB-5510 v2 (or SB-7510) to run an old program which uses 'LET' (there are a few!), the program will contain unwanted CLS commands, and these must be removed!

John also tells me that he recently had to repair the retaining catch on an MZ-80B tape deck; it was a bit of a tricky operation, but in the end he succeeded - so if you encounter this problem, I am sure John would be only to happy to offer advice.

Finally, Maurice tells me that whilst working on the 'RUN' bug in SB-6510, he devised an improvement to 'B800 MK5/P6'. In this program, you may remember, the command 'P' sends the codes 1B 0A to a P5 or P6 printer, to set up AUTO LF (thus allowing for the fact that B800 sends $0D to the printer at the end of each line).

Maurice suddenly realised that any printer used with an MZ-80B is normally set up to expect $0A at the end of each line, so he added a patch in the B800 printer routine, to convert $0D to $0A. The patch also converts all codes in the range $80-$9F to $20, to cover the fact that some printers (e.g. the Epson FX-80) treat $80-$9F as 'high bit' control codes. The resulting program, called 'B800 MK6', should work with ANY printer which is already in use on the MZ-80B and is set to NO AUTO LF.

'B800 MK6' is now in the MZ-80B Library, in place of B800 MK5/P6, and it has also been put on the new SB-7510 master disk, as one of the standard SUC utility programs. The 'P' command has been left active, and may be used to send any 2-bit ESC sequence ($1B XX) to the printer (the second bit, default $0A, is stored at $B887). ***

MZ-80B Librarian:-
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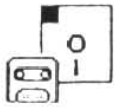
INKERSALL
CHESTERFIELD
S43 3DP
phone 0246-472894



NEW!! SUC MZ-80B DISK BASIC MASTER DISK

For a long time I have put up with the fact that I cannot RUN some machine-code programs off disk. Precisely WHY this happened I didn't know, and I couldn't find time to delve into the murky depths of SB-6510 to find out. However, early in October, Maurice phoned me to say that he had discovered that when you RUN a machine-code program off disk using SB-6510, the code is first loaded at the Basic program start address ($675C), and then it is copied either UP or DOWN in memory to its specified destination. The downwards copying routine is O.K.; but the upwards copying routine is 'bugged' and loses the first byte of the code.....This explained why some programs crash and others don't, and within a few days J.E and M.H. between them had devised a correcting patch.

But even with this 'bug' cured, problems can arise when you RUN a machine-code program off disk in this way. They are discussed in detail elsewhere in this Magazine, but they all happen because the machine-code program is first loaded at the Basic program start address before being moved to its final destination. In short, the filesize that can be handled is limited; any existing Basic source program is fatally overwritten; and Basic itself, even if it has not been overwritten, may have had some of its pointers corrupted. The only problem that need concern us here is the last one, and this is not fatal - if and when you return to Basic, an immediate 'NEW' will reset all pointers, and leave Basic ready to go.

One program that I really like is Knight's 'Commander' for SB-6510; but I have always been annoyed that I have do MON and load it from tape. So.... you've guessed, 'Commander' was the first program I tried to load from disk after typing-in the patch. No go! Maurice deduced that 'Commander' ($FA00-$FFFE) was overwriting the copying-up routine ($FF10-$FF1D) whilst it was working, and he solved the problem by relocating the copying routine, using two 'POKES'. At that stage, after all these years, I could RUN the 'Commander' off disk! However, to retain the integrity of SB-6510, we then had to modify 'Commander' so that after it has loaded it returns to Basic via 'NEW' at $1DCF (the original version returns to Basic via $1280, which is O.K. if you are loading off tape).

Maurice and I then had to decide the best way of promulgating our de-bugged version of MZ-80B disk Basic. After many lengthy discussions we came up with the idea of a new MZ-80B DISK BASIC MASTER DISK, which would incorporate the correcting patch and would also AUTO RUN Knight's 'B-Commander'; and we decided to call it DISK BASIC SB-7510, to avoid any future confusion between corrected and non-corrected versions. At the same time, we decided to permanently include several useful 'upgrades' which have appeared in previous issues of the Magazine. The creation of this new disk has recently occupied me during the early hours of several mornings, and I now describe its new features, below:

The SB-7510 opening display is a reminder of its new features:-

```
BASIC Interpreter SB-7510
Sharp Users Club 1992

COMMANDER IS NOW ON
NORMAL switches it OFF
CLS = CLEAR SCREEN
X$=SCRN$(n) makes X$ = n'th screen line (where n = 0-24)
Ready
```

Knight's MZ-80B 'Commander' was fully described in Vol.11 No.3, but here is a brief recap of the added facilites it provides:-

With 'Commander' ON, LIMIT is set to $FA00 and LIMIT MAX, if used, restores LIMIT to $FA00 (instead of $FF00). The command 'NORMAL' switches 'Commander' off and sets LIMIT and LIMIT MAX to $FF00.

In GRPH mode, the 4 CURSOR keys, HOME and CLR produce the appropriate 'graphics' symbols.

RENUMBER m,n renumbers the whole program (first line m, inc n).
DEL m - n deletes lines m to n.

DUMP n dumps variables (n = 0-7; 0 = ALL, 1-7 = different types)

TRON n switches on a 'trace' (n=1-255, 1=fastest, 255=VERY slow). OFF switches TRON off. N.B. 'TRON' is fussy e.g. it gives ERROR 1 if the program under test has no END statement.

****

On the new disk, 'Commander' is loaded by AUTO RUN at boot-up; thereafter, it may be switched off by NORMAL if required, though this is only necessary if you wish to run a VERY large program.

CLS replaces the old LET command. This means that if you happen to load an old Basic program which uses LET, it will be spattered with unwanted CLS commands, and these will have to be deleted.

X$ = SCRN$(n) is implemented by new code; there is a spare area in SB-6510, at $5B1A -$5CFF, and SCRN$ uses the top part of this.

We tried adding the REPEATING KEYBOARD code by Josef Riha, but in the end we left it out as there is a minor incompatibility between Josef's code and 'Commander' - with both installed, a held CURSOR key moves the cursor ONE SPACE in the direction of the arrow, but then prints a string of cursor graphics! We are looking for the cause of this, and hope to report on it in the next issue.

I hope you find SB-7510 an improvement over SB-6510 - I certainly do, but I'm biased! For those interested in the detail, the changes in 'RUN' and 'Commander' are given on the next page.

The new SB-7510 SUC master disk includes Filing CMT, Utility v2, AUTO RUN.BAK, B800 MK6, AUTO RUN, B-COMMANDER, BK CONVERTER, SUPERTAPE 2BJ, F-KEY LABEL, DISKEDIT.B4 and 6510B CENTRONICS (N.B. If you rename AUTO RUN to AUTO RUN.CMDR, and AUTO RUN.BAK to AUTO RUN, the disk will boot 'normally' i.e. WITHOUT 'Commander').

TECHNICAL DETAILS OF THE 'RUN' PATCH, AND MODS TO 'COMMANDER'

To transfer a machine-code file to its final destination, RUN in SB-6510 uses a 'dummy' copying routine at $522F; this is set up with the parameters of the specified file, and then moved up to $FF10 and executed there. This is meant to stop it being overwritten, but it doesn't always work! However, this is not the main problem - when copying UP, the routine uses LDDR, and should therefore start at the TOP of the file. But it calculates TOP as (START+SIZE), which is one too high, so the FINAL copy has an extra byte at the end, and its first byte is missing.

'RUN' in SB-7510 calculates TOP correctly as (START+SIZE-1). This could be done with one additional DEC BC, but John Edwards added two DEC HL's, to keep the code in line with MZ-80A disk Basic SA-6510 (which Sharp got right!). To make space, John rewrote a largish block of code, starting at $520B and ending at $522E, leaving the 'dummy' routine at $522F unchanged:-

	PART OF 'RUN' (SB-6510)		PART OF 'RUN' (SB-7510)		
5208	CALL 18DCH	CDDC18	CALL 18DCH		CDDC18
520B	JR C,5227H	381A	LD A,0B0H		3EB0
520D	LD A,0B0H	3EB0	JR NC,5217H		3008
520F	LD (5239H),A	323952	EX DE,HL		EB
52..	LD (5233H),HL	223352	ADD HL,BC		09
	LD (5236H),DE	ED533652	DEC HL	+++	2B
	LD BC,000EH	010E00	EX DE,HL		EB
	LD HL,522FH	212F52	ADD HL,BC		09
	LD DE,FF10H	1110FF	DEC HL	+++	2B
	LDIR	EDB0	LD A,0B8H		3EB8
	JP FF10H	C310FF	LD (5239H),A		323952
			LD (5233H),HL		223352
	EX DE,HL	EB	LD (5236H),DE		ED533652
	ADD HL,BC	09	LD BC,000EH		010E00
	EX DE,HL	EB	LD HL,522FH		212F52
	ADD HL,BC	09	LD DE,FF10H	+++	1110FF
	LD A,0B8H	3EB8	LDIR		EDB0
	JR 520FH	18E0	JP FF10H	+++	C310FF
522F	LD BC,FFFFH	01FFFF	LD BC,FFFFH		01FFFF
5232	LD HL,FFFFH	21FFFF	LD HL,FFFFH		21FFFF
5235	LD DE,FFFFH	11FFFF	LD DE,FFFFH		11FFFF
5238	LDIR	EDB0	LDIR		EDB0
523A	JP FFFFH	C3FFFF	JP FFFFH		C3FFFF

Significant instructions in the new SB-7510 code are shown by +++. The added DEC HL's correct the top address of the file being loaded. The other two lines contain the destination address of the copying routine, which must be changed before 'Commander' is loaded; AUTO RUN changes this address to $F910, by POKEing $5229 and $522E with $F9. (N.B. Don't try these POKES in SB-6510, the addresses are different and the routine is bugged anyway!)

The initial execution loop in 'Commander', which starts at $FF89, has been rewritten to return to Basic via NEW at $1DCF, instead of a via 'warm start' at $1280. This resets any Basic pointers which may have been disturbed by loading the program off disk via the 'RUN' command. ***

FDOS and CP/M on the Sharp PC-3201 by Maurice Hawes

In April 1992 I finally acquired a Sharp PC-3201 (known in Japan as the YX-3200). The U.K. name is misleading - it is in no way an IBM-Compatible. It was Sharp's first serious attempt at a business machine, Z-80 based, and with a separate 80-column VDU, a numeric keypad, function keys, RAM expandable to 112K, a Basic-in-ROM. and external (optional) 5.25" 320K disk drives. On a standard machine there is no way of switching out the Basic-in-ROM at $0000-$4000; Sharp's own disk software therefore loads at (around) $4000.

The PC-3201 FDOS system (it appeared in two versions, 4.01 and 5.01) is cumbersome. The machine can support TWO disk I/F cards, each of which can drive 4 x 5.25" drives - so in theory 8 drives are possible! If two disk cards are fitted, one is referred to as 'CHANNEL A' and the other as 'CHANNEL B'. If you have all eight drives fitted, they are referred to by FDOS as A0-A3 and B0-B3. However, to come down to earth, if you have just one I/F card and 2 drives, these drives are referred to by FDOS as A0 and A1.

But FDOS need not detain us further - it is really just Sharp's way of running their PC-3201 disk version of BASIC, which is quite powerful, but has so many anachronisms that it is best forgotten.

The PC-3201 can run CP/M, and Sharp marketed their own version, which announces itself 'SHARP YX-3200 CP/M VERS 2.2 (A.1)'. This must be the strangest CP/M ever - to avoid the Basic ROM, PAGE 00 is at $4200 and programs load at $4300, thus defeating the main object of CP/M, which is to allow software to run on any machine. Even worse, this version of CP/M lacks programs to FORMAT and COPY disks - the Sharp CP/M Manual tells you to do this with the Sharp FDOS commands INIT and BACKUP. No problems with INIT, of course; but BACKUP will not copy a CP/M system disk, because it checks some byte or other on such a disk and misinterprets it as part of an FDOS 'secure' file, which it will not copy. So the only way to create a new CP/M system disk is to use 'SYSGEN' and 'PIP'.

MicroTechnology Ltd. had other ideas. They designed what they called a 'relocator' board. You plug it into a spare expansion slot, transfer two chips to it, and <BINGO> they may be switched out of the way. You can then run M-T's version of CP/M for the PC-3201, which comes up as '64k CP/M version 2.2.2.00', and has PAGE 00 at $0000, and programs loading at $0100. The system will look very familiar to any Sharp owner who has used CP/M on the MZ-80A or MZ-80B, and it includes FORMAT, BACKUP and FILES. Most standard CP/M programs seem to run O.K. and I now have WORDSTAR, PEACHTEXT, SUPERCALC, DISX and DISCMOD running on my PC-3201.

But to be honest, the PC-3201 is so bizarre that I would advise anyone to think twice about parting with real money for one unless it is DEFINITELY fitted with the M-T relocator board (this board is normally located in the TOP L.H. slot as seen from the rear, and labelled 'SYSTEMS OF TOMORROW PCB 004/1').

Having said that, a PC-3201 fitted with M-T's relocator board and M-T's CP/M is a useful computer; with PEACHTEXT or WORDSTAR it makes a comfortable CP/M word-processor. And for Sharp 'nutters' it has a lot in common with the MZ-3500 i.e. virtually the same keyboard, virtually the same FDOS, and similar Basics. ***

MZ700 News

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RESET

Not too much this time I'm afraid, but what we do have is good stuff. A big thanks to all who have contributed this time. And if any member wants to see a specific article, but doesn't feel inclined or experienced enough to write it, all you have to do is let me know and I will 'put it out to tender'.

LETTERS

Support of Sorts - *From George Lynch, Edinburgh*

I was in Aberdeen in July and called into Knights. I got a warm reception from Graham Knight and his partner. I was assured that the small software order I placed would be posted to my home the following week. Eight weeks later and several phone calls, I wrote asking for my money back. Before they could have received my letter, the tapes arrived with a couple of extra tapes to ease my disappointment. The moral of this story is that if members intend to order any MZ-700 software from Knights, they should be prepared for a long wait.

****

Fur Ihre Akten (For your files)
Fur den SHARP MZ-700

Sitting in front of me at this very moment is a German KERSTEN & PARTNER Datensysteme 3.5" disk drive. So what?, I hear you say. Well the drive was sold in this country by Sharpsoft as a single-sided 180KB capacity unit, but because of the relatively high prices and lack of disk software, sales must have been low and the fact that there are only two British members (700 section) with 3.5" drives in the Club also shows evidence. However, the unit I now have is a full 40 track 320KB drive and seems to be unique in this country. Go on, tell me something different.

There are one or two foreign members who have similar units and I must ask them to send me any written material/software etc which relates to these drives and I can return their disk with CP/M, any DBASICs or any library software. And if **Alan Waite** of **Blackpool** would like to send me a disk with something on it, I will put a few Club programs on it to see if we have any compatibility between our two 3.5" systems.

By linking the 3.5" drive to my dual 5.25" units, I can, after a bit of link changing, transfer software between the two sizes. If any member who prefers using K&P DBASIC but would like a bit more free size, which the smaller version has to offer (33KB), then I will put a copy of that K&P DBASIC on 5.25" for you. You only have to ask.

****

(SUB-ED's note. Eric Stanley has sent in two modified versions of K&P DBASIC. The first version (V1) has had some code deleted to allow the disassembler from Z80 MACHINE to be used and interact with the BASIC. The second version (V2) will be of great use to any user who, after upgrading to disk drives, finds that his/her programs written with a modified S-BAS will not run under DBASIC.)

MODIFIED K & P DBASIC V1
by Eric Stanley

After much difficulty, I have managed to add a disassembler to K&P DBASIC. To access the disassembler, enter BYE [CR] to jump to the RAM MONITOR and then "O" [CR]. I have also added "C" which can be used to compare two blocks of code.

To make room for the mod. I have had to delete JOY, PRINT USING, ALL PLOTTER COMMANDS and the MZ-80K conversion code.

MODIFIED K & P DBASIC V2
by Eric Stanley

This BASIC has been modified to include the following extra commands and functions. The spare space for the code has been obtained by deleting the joystick command JOY which is rarely used and all PLOTTER commands. (PLOT ON and PLOT OFF are still available to users with external printers. Sub-ed.)

NEW COMMANDS

BDR n	: This prints a coloured border.
NCOLS n,n	: This changes fore and background colours.
SEARCH	: As in Sharp DBASICs and FIND in SOLO Extender.
PRSKEY	: Stops program, waits for a keypress and prints "Press a key to continue" on the screen.
BOX n,n	: Prints a thin line box at cursor position.
ELSE	: Adds ELSE to IF THEN.
WHILE:WEND	: Conditional loop.
REPEAT:UNTIL	: " "
SCREEN 1,2,3,4	: See "SHARP BASIC INSIDE & OUT" - Pages 81 to 85
LVARS	: List variables (no values) on screen.
DUMP	: Dumps screen to printer (Sometimes called COPY).

FUNCTIONS

CTRL/D	: Initializes Colours and Console as in Sharp and HUDSON BASICs.

Continued on next page.

To recap - Only one MC program up to 32K in size can be held at any one time, but as you can tell, a user can easily change his chosen BOOTable program or use the board as an external RAM device for storing data. The MZ-1U06 is needed to use the board and any data held is secure at switch off.

I have only two of these boards and interested parties should send me a £20.00 cheque/P.O. payable to Paul Trainer.

****

LIBRARY

New additions to the 700 Library:-

Tony Clarke has sent me a second disk full of MZ-80K programs, some of which have been converted and tested for the MZ-700/800 whilst some are still slightly bugged and might need one or two POKES changing etc. Anyway the titles are:- PRO-GOLF, BATTLESHIPS, CHOMP, NEW GOLF, GOLF, HAMURABI, BREAKOUT, DR LIVINGSTON, WORLD POWER, SPACE ATTACK, L-GAME, MORTAR ATTACK and ELECTRIC Co. Some of the titles duplicate programs already in the 700 Library, for this reason, I will keep these disks as a separate limb of the standard Library disks, let's call it the MZ-80K ANNEX. Have you converted any good 80K stuff?

S*CALGO (tape version). At around the same time, both John Keyworth and myself tried to make tape copies of S*CALGO. We both had some success with the MONITOR S command; John's S1200D3CF1200 and my S1200D3E01200 both auto ran but only after a bit of gibberish was displayed first. Maurice was asked for his input and he came back with S1200CFFF47FA which just happened to be the correct addresses. So we now have a full working tape copy of S*CALGO for both 700 and 800. Send a £5.00 cheque/P.O. made payable to P. Trainer for a copy of the optional S*CALGO manual. By-the-way, if, like one or two members have reported, your copy sometimes has problems loading on the 800, flick your mode dip-switch to 700 mode and thanks to John Keyworth loading problems should end. See 'COMMENTS ON S*CALGO' in the 800 section.

MZ ALPHABET is a BASIC educational program aimed at the pre-school and upwards age group. It helps the kiddies to get used to the alphabet and if the correct letters are input, the 700 will repeat the letter in synthesised speech and again at the end of the program. A bit of imagination should be used when listening to the sounds, but given the comparatively poor sound output of the 700, I don't think it's a bad effort. I would say that though as I wrote it. It seems to sound better on the MZ-800.

dBASE II Maurice sent me a MZ-80B CP/M disk containing a P.D. lookalike version of dBASE II plus relative files and when I tried the disk on the 700 under 700 CP/M it loaded and ran OK. CP/Mers out there need only to send me a blank disk for their copy. The same applies for a CP/M disk sent to me by **John Duxbury**, the disk contains lots of text based games which run under CP/M as COM files and BAS files which run from a PD version of MBASIC which is also on the disk. Most of the items will be best appreciated running on an 80-column system.

THE AUTHENTIC VERSION OF MZ-700 Hu-BASIC

We have recently been able to study a copy of the Kuma Manual for this Basic. It is a very long document (153 pages) and a lot of it is standard stuff, so we thought the most sensible thing to do would be to precis its contents for the benefit of members.

CHAPTER 1 is introductory; it explains how to load Hu-Basic off tape, and states that the default configuration is:-

```
WIDTH 40:COLOUR 7,0:CGEN:CFLASH:CREV:CSIZE:PALET:PRW:WINDOW:
CONSOLE:SCREEN 0,0,0:DEVICE"CAS:"PLAY"VO:VO"
```

Chapter 1 then goes on to programming, and states that line numbers can be 0-65534, and lines may be up to 255 characters long, including the line number. Screen-editing is possible, using the cursor keys, INST and DEL. All keys repeat by default, but this feature can be controlled by REPEAT ON and REPEAT OFF.

Chapter 1 ends with a list of CTRL key functions, many of which are intended mainly for screen-editing:-

CTRL/A	sets/cancels AUTO INSERT mode
CTRL/B	moves the cursor one word LEFT
CTRL/C	same as SHIFT/BREAK
CTRL/D	initialises the screen (= INIT)
CTRL/E	erases the line from the cursor onwards
CTRL/F	moves the cursor one word RIGHT
CTRL/G	rings the bell
CTRL/H	= DEL LEFT
CTRL/I	= TAB
CTRL/J	= LF
CTRL/K	= HOME
CTRL/L	= CLR
CTRL/M	= CR
CTRL/N	scrolls the screen above the cursor, UP
CTRL/O	scrolls the screen below the cursor, DOWN
CTRL/P	no action
CTRL/Q	ends a temporary HALT (see CTRL/S)
CTRL/R	= INS
CTRL/S	causes a temporary HALT to program execution (= BREAK)
CTRL/T	sets a TAB
CTRL/U	no action
CTRL/V	no action
CTRL/W	combines the current line with the line following
CTRL/X	no action
CTRL/Y	cancels a TAB setting
CTRL/Z	CLEARS the screen below the cursor

We have found by testing that our copy of MZ-700 HuBASIC does NOT behave as above in 3 cases. These are:-

CTRL/U	switches to UPPER CASE with normal grey square cursor
CTRL/V	switches to LOWER CASE with white square cursor
CTRL/W	switches to GRAPHICS with normal graphics cursor

Also, the commands DEVICE, INIT, PRW and SCREEN, referred to in Chapter 1 exactly as quoted above, are not mentioned again at any point in the Manual. Their exact purposes are therefore not clear.

CHAPTER 2 explains Basic constants; these may be expressed normally (i.e. in decimal), or in BINARY with the prefix &B, or in octal with the prefix &O, or in hexadecimal with the prefix &H.

Decimal numbers may be integer, single-precision (8 s.f), or double-precision (16 s.f). Double-precision numbers are indicated by a trailing # sign, or by 'D' instead of 'E' in exponent form.

Variable names may be any length; upper/lower-case are treated as the same. The precision of a numeric variable is indicated by a trailing symbol (the '!' for single precision is optional):-

AA% = integer; AA! = single precision; AA# = double-precision

Reserved words may not be used as variable names. Arrays number from 0 by default, but this may be changed to 1 by OPTION BASE.

Arithmetic operators include the usual five (+ - * /) plus the °backslash° for integer division, and MOD for modulus.

This chapter states that strings are sorted on a character-based priority according to 'the ASCII codes listed in Appendix I'; but in our copy of the Manual this list is missing. Special graphics characters are available on CHR$(0-31) and may be printed on the screen with the command PRINT#0 e.g. PRINT#0 CHR$(7) shows a transistor symbol. PRINT#0 does not require a file buffer.

Logical operators are NOT, AND, OR, XOR, EQV and IMP.

CHAPTER 3 starts by briefly listing 170 statements, commands and functions in groups according to their purpose, and then goes on with a long alphabetically-ordered section which explains most of them (but not all) in detail. Many keywords are the same as those found in Microsoft Basic (experienced readers will already know that Hu-BASIC is strongly related to Microsoft Basic).

The unusual commands are listed below; those marked * appear in the list at the start the Chapter, and some of them appear later, in example programs; but they are not explained in detail:-

BOOT - go to ROM Monitor
CALL - call a machine-code program e.g. CALL &HFE00
CLICK ON/OFF - turns key-click on/off
CSRLIN - reports the vertical position of the cursor
DEF USR (n) = &HFE00 defines USR n as starting at $FE00 (n = 0-9)
DTL - reports the line number of the current DATA statement
EDIT - displays a program line, ready for editing
FRE - reports free memory e.g. FRE(X) where X is a dummy
INKEY$ - reads a character from the keyboard buffer
INPUT$ - reads a string from the keyboard or a file
KEYO - just before INPUT, simulates KBD input for program testing
LLIST - list to printer
LOAD? - verifies the file which has just been saved
LOADM - loads a machine-code program
LPOS - reports the position of the printer head
LPRINT - print to printer
MAXFILES n - sets the number of files (default 1, can be 0-15)
NEWON - restores machine to 'power-on' status
OPTION BASE n - sets lowest array subscript (n = 0 or 1)
PAI - gives multiples of 'pi' e.g. pai(3#) = 9.42477796076938

PAUSE n - hold program execution for n tenths of a second (approx)
PEEK@ - peek VRAM
PLAY - replaces MUSIC/TEMPO e.g. PLAY MU$ or PLAY n (n = 30-7500!)
POINT - reports the palet code of a dot on the screen
POKE@ - poke VRAM
POS - reports the horizontal position of the cursor
PRINT#0 - prints special characters, including CHR$(0) to (31)
RENUM newstart,oldstart,inc (N.B. newstart<oldstart if both given)
REPEAT ON/OFF - turns key-repeat on/off
SAVEM - saves a machine-code program
SEARCH "AB" - lists lines with "AB" (upper/lower-case different)
SPC and SPACE$ are BOTH allowed
SUM (n) - returns sum of integers 1 - n (limit n = 1.3 E19 approx)
SWAP - swaps the value of two variables e.g. SWAP A$,B$
WRITE - prints data on the VDU, INCLUDING quotes and commas

CHARACTER$(x,y) returns the character at position x,y
DAY$ ="SUN" (first 3 letters) sets the day on the MZ-700 clock
HEXCHR$("414243") returns the string 'ABC' i.e. hex $41$42$43
MEM$ (&HFF00,3) = "CAT" stores the 3-byte string CAT at $FF00
SCRN$(x,y,n) returns string length n, from screen position x,y

BIN$ - converts a number to binary form e.g. BIN$(16) = 10000
HEX$ - converts a number to hexadecimal form e.g. HEX$(16) = 10
OCT$ - converts a number to octal form e.g. OCT$(16) = 20

CINT(X) performs 'true' rounding (<0.5 down, the rest up)
FIX(X) rounds +ve numbers down, -ve numbers up
INT(X) rounds all numbers down
FAC(n) returns factorial n (n = 0 to 33)
FRAC returns the decimal part of a number

* CFLASH - prints flashing characters
* CGEN - switches to user-defined character-generator
* CREV - prints characters in reverse video
* CSIZE - creates over-size characters
* DEF CHR$ - creates a user-defined character
* OPTION SCREEN - switches graphics RAM to use as ordinary RAM
* WAIT - waits for a specified byte at an input port
* WIDTH - WIDTH 40 and WIDTH 80 are mentioned in sample programs
* WINDOW - relates logical co-ords to absolute screen co-ords

(Also DEVICE/INIT/PRW/SCREEN, quoted with no explanation in Ch. 1)

APPENDICES (the CONTENTS page lists only B,D,E,G,H,I,J and K)

APPENDIX B explains that the HuBASIC RAM Monitor (accessed via the MON command) allows direct input of machine code in the form:-

:address data data data .....

The starting colon must be typed OVER the asterisk prompt; the address can be up to 4 hex digits; each data item can be either a 2-digit hex code, or a character preceded by a semi-colon e.g:-

:FE00 3E ;A CD 13 00 C9 <CR> (SPACES must be left as shown
<SHIFT/BREAK> (SHIFT/BREAK to end session

From the RAM Monitor asterisk prompt, the commands P, D, M, F, D, T, S, L, V and R act as in the normal MZ-700 Basic RAM Monitor.

APPENDIX B also deals with the use of USR. It explains that it MUST first be defined using DEF USR (n), after which the command is implemented as USRn (variable). The exact procedure for passing data to/from a subroutine is explained in detail on pages 141-143 of the original Manual, reprinted at the end of this article.

APPENDIX D deals with internal and external representation of numeric data, and marginal floating-point errors.

APPENDIX E, shown on the contents page as dealing with file descriptors, is completely missing from our Manual!

APPENDIX G deals with error messages (numbers). These are NOT the same as in standard Sharp Basics which use error numbers:

1 NEXT WITHOUT FOR	2 SYNTAX	3 RETURN w/o GOSUB
4 OUT OF DATA	5 ILLEGAL FUNCALL	6 OVERFLOW
7 OUT OF MEMORY	8 UNDEFINED LABEL	9 SUBSCRIPT o/o RANGE
10 DUPLICATE DEFN	11 DIVISION BY 0	12 ILLEGAL DIRECT
13 TYPE MISMATCH	14 ---	15 STRING TOO LONG
16 TOO COMPLEX	17 CAN'T CONTINUE	18 UNDEFINED FUNCTION
19 NO RESUME	20 RESUME w/o ERROR	21 ILLEGAL FORMAT
22 MISSING OPERAND	23 LINE BUFF O'FLOW	24 ---
25 BAD RAM MODE	26 UNTIL w/o REPEAT	27 OUT OF TAPE
28 ---	29 TAPE READ ERROR	30 BAD FILE MODE
31 OUT OF STACK	32 WHILE w/o WEND	33 WEND w/o WHILE
34 RESERVED FEATURE	35 FOR w/o NEXT	36 FORMAT OVERFLOW
37 REPEAT w/o UNTIL	38-49 ---	50 FIELD OVERFLOW
51 DEVICE IN USE	52 BAD FILE NUMBER	53 FILE NOT FOUND
54 FILE ALREADY OPEN	55 ---	56 DEVICE I/O ERROR
57 FILE EXISTS	58-59 ---	60 DEVICE FULL
61 INPUT PAST END	62-63 ---	64 BAD ALLOCN TABLE
65 BAD FILE DSCRPTR	66 BAD RECORD	67 NO PASSWORD
68-70 ---	71 FILE NOT OPEN	72 WRITE PROTECTED
73 DEVICE OFFLINE		

ERROR 34 is intrigueing! It is said to occur if and when you 'unsuccessfully attempt to execute a DISK BASIC command' (!)

APPENDIX H shows the memory map, which is conventional.

APPENDIX I is very short; there is no table of ASCII codes, but merely a statement that 'all 256 characters may be accessed in programs via CHR$, and printed on the screen by using PRINT#0'.

This is not the full story. CHR$(32-255) are standard MZ-700 characters, and come out the same with PRINT or PRINT#0. But CHR$(0-31) are different; with PRINT they simulate CTRL codes (e.g. PRINT CHR$(1) = CTRL/A, CHR$(2) = CTRL/B etc.); but with PRINT#0 they produce graphics characters, most of which are only accessible via DISPLAY codes in standard Sharp Basics:-

CHR$(0-15) = DISP. F0 EF E0 E1 E2 E3 E4 EA E6 EB EE C5 C6 F1 F2 F3
CHR$(16-31)= DISP. F4 F5 F6 F7 F8 F9 FA FB FC FD FE FF C3 C4 C2 C1

APPENDIX J shows how to construct secant, cosecant, cotangent and hyperbolic exponential functions, and their inverses.

APPENDIX K is a glossary. A gremlin has been here; 'background color' is defined as 'a reserved copy of a file' (!) ***

Hu-BASIC Manual Appendix B, Part B - THE USR STATEMENT

When using USR, its address must be defined beforehand; for this purpose DEFUSR is used, in the form DEFUSRn = &Hxxxx, where n can have any value 0 - 9 . If n is not specified, 0 is assumed; if no address is specified, the last specified address will be used.

USRn is then brought into play with a command in the form:-

variable out = USRn(variable in)

for example, B = USR1(A) or C$ = USR2(A$)

Note that the type of data cannot change i.e if the variable fed in is a number, then the variable out must be a number too.

The status of the registers during data transfer is as follows:-

IX - holds the error-processing address. Errors are processed by placing the error number in A and then performing JP(IX).

A - holds the data type i.e. 2 = integer; 5 = 1-precision F.P.; 3 = string ; 8 = 2-precision F.P.

HL - holds the memory address at which data storage begins. But this store cannot hold character data, so a string is identified by its length and by an offset pointing to its location. Thus, the format for the storage of variables at (HL) is:-

integer, 2 bytes	low:high
1-prec., 5 bytes	exponent(1 byte):mantissa (4 bytes)
2-prec., 8 bytes	exponent(1 byte):mantissa (7 bytes)
string , 3 bytes	length(xx):offset(xxxx)

Note that the exponent part of an F.P. number is offset by +$80 i.e. $80 indicates an exponent of 0. Thus, and exponent of +2 is indicated by $82, whereas an exponent of -2 is indicated by $7E.

The MSB of the mantissa part of an F.P. number indicates the sign of the number (0 = positive, 1 = negative).

With strings, length may be up to 255, and the offset is taken from the start of the string area. But these values may NOT be put in by the user - see DE and B registers below.

DE - this register is significant only when A holds the value 3 (i.e. it indicates a string). In that case the start address of the string is in DE, and its length is in B. If B = 0, then DE has no meaning. If the string is rewritten, it must not be longer than the value in B.

If the string is a character variable, DE holds its direct address, and the value of the variable is changed.

If the string is an expression, it should be passed into the USR function with a trailing space e.g. USR(A$+" ").

****

USING A SHARP P4 PRINTER ON THE MZ-700

By William Blankley

(Editor's Note: for those who do not know the P4, all Sharp MZ-80P printers are reviewed in the GENERAL section of this issue.)

However did I come by a P4? Being broke, and not having worked for twenty odd (or even) years, there seemed little point in going to the Hastings Electronic and Radio Club's annual junk sale. But I did, to watch the fun! There were lots of printers, the usual Epsons, and even a strange NEC machine leaking messy black toner. Rubbish was changing hands at a tenner a time, so when we arrived at the quality merchandise, one Sharp P4 fitted with MZ-80B ROMs, I expected to be out of my class. £14 later it was mine all mine! That night it sat next to the bed and, as I leave the light on all night, it was drooled over every half hour. No way was I going to part with my P4 - proper Sharp codes and no patches, I imagined...

The next day I crawled out of bed at 11.45, and reached for the pigeon's nest that doubles as a Centronics lead (yes, the P4 has a 36-way Centronics connector). There are times in a man's life when the consummation of all his worldly desires seems just at hand and then goes all awry, and this was one - all the lower-case was up the creek. Little did I know, but I do now, about the MZ-80B and its funny ways - standard ASCII, but with Sharp handshake !!!!!

Maurice helped me sort it out. The P4 ROM set is very easy to change, and although there is no MZ-700 ROM set, the MZ-80A ROM set is almost 700-compatible (only 2 characters are different, at $6C and $7F, and neither of these is of any great importance).

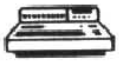
To finish the job I bought an MZ-1C47 700-to-Centronics lead for £4-00 (from the Club). Glowing with pride, I plugged it in, and the printer sulked! Pride cometh before a fall so they say, but it didn't take me long to sort it out (and I later read the answer in a Club Magazine, as I relaxed over a small cup of raving juice).

In short, the P4 was sulking because it had the wrong voltage on PIN 31. Using an 1C47 lead on a normal MZ-700 this pin (Sharp IRT) is normally at 0v, and this causes the printer to sulk, because it is permanently RESET. You can just remove the wire from PIN 31 but on the P4 printer PIN 34 is meant for the SHARP IRT signal; so a more elegant solution is to move the wire on PIN 31, to PIN 34.

I do realise that there are people in this world who react to an invitation to pick up a soldering iron as if they had been invited to commit Honorable Sepuku. For them, it is possible to change the printer software so that it first sets IRT to +5v, and then keeps it there. But I have not needed to do that - not yet, anyway!

If your P4 has MZ-80B eproms, you will need to modify Basic with one of Maurice's 'Centronics' programs, to send ASCII lower-case codes, and $0A as the end-of-line character. The alternative is to use an MZ-80A eprom set, then no software mods will be needed.

There are a few loose ends - I need an 'additional paper guide' to finish things off properly, and it would be nice to have some spare eprom carriers, and a 'Centronics' eprom set to play with. Also, I am now very curious about the MZ-80B, what can it do ? Until the next junk sale perhaps ? Meanwhile, stay Sharp! ***



MZ800 News

Your Sub-Editor is:-
Paul Trainer
1 Montagu Gardens
Oakwood, Leeds
West Yorkshire LS8 2RN

Tel. (0532) 498985

LIBRARY

New Additions:- See MZ-700 section for more additions.

MZ-800 TIME is a BASIC program written by Paul Trainer (yes, me). I thought it was about time I did something, albeit a 'clock program' for the 800 which did not come from the MZ-80B or out of a book. I converted it from a program I wrote many years ago for a Memotech MTX Owners Club competition. It won a third prize.

I have also converted another selection of mainly graphics demo programs from the MZ-80B which are a good point of reference when you all start writing your own full-blown 800 programs. They are:- **Graphic demos 1-8, Planets 800, Photo of the MZ-80B and Union** Jack which is a graphics demonstration taken from 700/800 EXPOSED and sent in by **Fred White.**

A tape version of S*CALGO has evolved from the Quick Disk version. See 700 Section and below for more details.

COMMENTS ON S*CALGO V 4.0
by John Keyworth

The first problem I encountered was that when loading the program on the MZ-800 from QDisc, the screen went blank. A press of the reset button to return to I.P.L., then M for the Monitor and entering **J47FA** was required to get the program running. The reason when I found it was surprising. The machine was set in 800 mode as the instructions clearly show the program is intended for the MZ-800. (There is also a reference to the Japanese 800, the MZ-1500 which the program was probably initially written for. Sub). There is no mention of putting the 800 into 700 mode to run it. Paul tells me that he keeps his 800 permanently in 700 mode as he has yet to come across a program for the 800 which will not run in that mode.

I found that I could not load the disc on my 700 as I don't have the I.P.L. **ROM** and got 'insufficient memory' when trying to load from QD BASIC. Maurice was told and I now have a tape version which I can load successfully on either machine. (Because of its size of 48k, S*CALGO cannot be copied by TRANS and I have had no joy with FILING (CMT) on the K&P DBASIC disk. The only obvious way to copy S*CALGO seems to be with the utility QD COPY or with the S command at the MONITOR prompt. Sub-ed)

The program has full arithmetical functions when sorting either text or figures in ascending or descending order, moving/locking columns or rows amongst its capabilities.

Article continued on next page.

The first column S is fixed at 7 characters wide, the others can be selected as either 15 columns of 5 characters or 7 columns of 10 characters. It is also useful as a mini wordprocessor particularly to print proformas or lists. If the columns are configured to 10 characters wide, this gives a line of 78 columns across, ideal for the normal printer. It is very easy to print more or less anywhere on the page using column letters and line numbers. This is much simpler than using TAB or CURSOR numbers and you can see what you are doing. I have not tested the special print options having no printer/plotter connected (I have - see below. Sub-ed.) and have not been able to use SEARCH to the full. Otherwise it functions very well. It also works well as a fast database. It is a pity one can't do a DIR of the data disc from within the program and that it requires a non-Sharp printer to be set on AUTO LF, but these are not serious defects.

Verdict - S*CALGO is a very versatile fairly small spreadsheet having many, very useful features. Whilst not as powerful as HU-CALC, it has the advantages of comprehensive documentation and simplicity of use.

A WAY OF COPYING S*CALGO TO FLOPPY by John Edwards/Maurice Hawes. Detailed by John Keyworth.(I knew I'd spoken too soon. Sub-ed.)

Step 1 - Load S*CALGO V4.0 from Quick Disc and save onto C60 tape using S1200CFFF47FA and name it whatever you like. Make note of the tape counter, but do not rewind it.

Step 2 - Save the first half of the program onto tape using S12005FFF47FA and name it PT1. Make a note of the tape counter. Do not rewind though.

Step 3 - Save the second half onto tape using S6000CFFF47FA and name it PT2. Now rewind the tape. If you do not have a floppy drive on the 800 transfer the tape to the tape deck on the 700.

Step 4 - Load K&P DBASIC master or better still a copy of it and DELETE all other files on the disc. This may not be essential but it is safer and you can put the programs back afterwards. Now RUN the utility FILING(CMT).

Step 5 - Fast forward the tape to the start of PT1 and transfer the program to the K&P DBASIC disc. Then fast forward to the start of PT2 and do the same. Rewind and remove the tape.

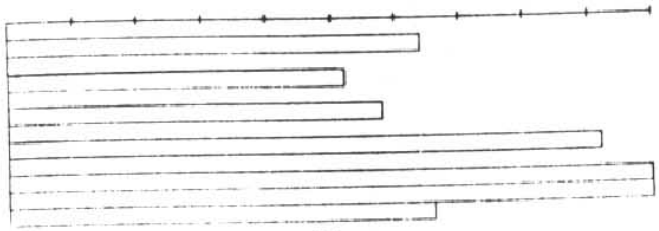
Step 6 - Load DISKEDIT and go to track 1, sector 1 where the directory details of the two programs are displayed. Change the 00 4E of the entry for PT1 to 00 BE which is the full length of the program, then change the name to S*CALGO V4.0D.

Step 7 - Change the 01 (filetype) at the start of the entry referring to PT2 to 00 which stops it being listed on the BASIC directory or DELETE it from the BASIC directory. You should now have a loadable version of the full program on floppy which you can RENAME "AUTO RUN" if you choose.

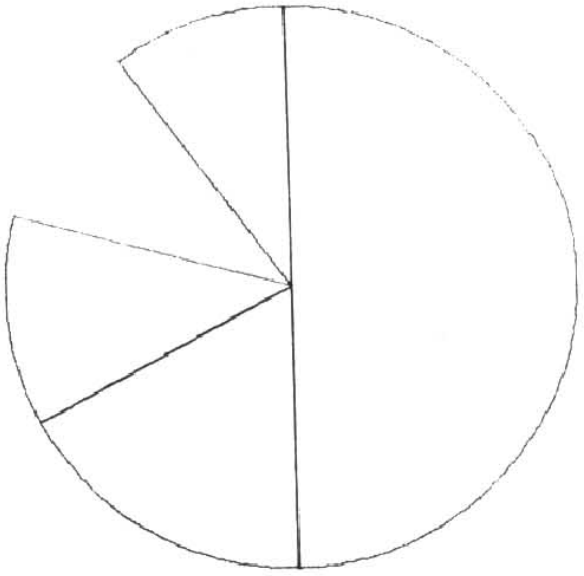
N.B. Although you now have the program on floppy, it will only make use of the QDrive or tape for its input/output.

S*CALGO PRINTOUTS

SCALE VALUE=10



B010	JIRO	64
C010		52
D010		58
E010		92
F010		266



F010	JIRO	266	50*
E010		92	17.3*
B010		64	12*
D010		58	10.9*
C010		52	9.77*

DR LOGO

Remember Maurice's and L. Finlay's OPSYSTEMS/BASICs article in Vol. 11/3 and a mention of an elusive language for the MZ-800 called DR LOGO with the part reference no. 1Z-019. Well, it seems that a copy is about to find its rightful resting place with me in the 800 Library. You should see more about it in the next issue. However, we have no manual for DR LOGO, if you have a copy, please let me or Maurice know about it.

E.O.F. (End of File)

I think these sections have had another good year with some relative and topical contributions, let's have more of the same for 1993 please. Have a merry Christmas, a happy and prosperous (please) new year and don't forget - The Club can only support you if you support it - renew with us.

Re-defining the function keys under CP/M on the MZ-3500

In Vol.11 No.2 (p.63) I reported 3 versions of MZ-3500 CP/M (i.e. v1.2B & v2.0A by Sharp, and v2.2.2.00 by MicroTechnology). Some time later, in Vol.12 No.2 (p.58) I reported the discovery of extra pages for the official MZ-3500 Sharp-CP/M Manual, which state that there were THREE 1.XX versions, and also imply that these versions cannot access the programmable keys (i.e. the extra pages explain in great detail how V2.0A CAN redefine these keys).

I am pretty sure that the other version of CP/M for the MZ-3500, by MicroTechnology, can access the programmable keys too; but as we have no documentation whatsoever for this version of CP/M, it is hard to confirm, except to say that the key-definitions can be seen in the system tracks under a direct-disk-editing program.

I intend to do more research on this, but for the moment, all I can offer are two short programs to re-define the programmable keys under Sharp-CP/M v2.0A on the MZ-3500, for PEACHTEXT and WORDSTAR. They are called PTKEYS.COM and WSKEYS.COM respectively.

****

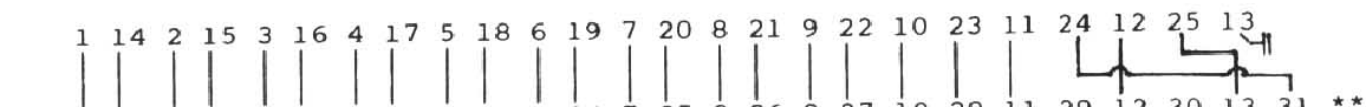
STANDARD MZ-5500/5600 CENTRONICS PRINTER LEAD

Following an enquiry by a new member with an MZ-5500, I realised that, although the table of connections in the MZ-5500 and MZ-5600 Service Manuals is correct, it is easy to misinterpret. In the end I had to take the working lead out of my own MZ-5600 and draw a diagram, to satisfy myself that the table was in fact correct.

For the benefit of posterity, the diagram that I drew for myself is reproduced below; it shows that the lead is quite easy to make if you use a 25-core ribbon cable and IDC ribbon connectors; but it also reveals why it is so easy to make a mistake!

(The 25th core is left in at the 25-way end only to ensure that the ribbon cable fits correctly into the IDC connector.)

25-way D-connector at the 'SHARP MZ-5500/5600 COMPUTER' end
(PIN 13 removed and its lead cut off outside the connector block)



36-way 'CENTRONICS' connector at the printer end
(N.B. beyond **, pins 14 32 15 33 16 34 17 35 18 36 are not used)

In other words, counting from 1 at the 25-way end, the first 21 cores of the cable are 'straight through', the next core goes to Centronics pin 31, the next core is straight through, the next core goes to Centronics pin 13, and the last core is cut off. Easy when you know how!

The Service Manual states that HOLE 13 of the 25-way computer printer socket 'may be blanked off'; if it is, you should remove PIN 13 on the 25-way plug as suggested above. But if it is not, this step is unnecessary, as the core is cut off anyway. ***

Edited by:
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Reading RG3 7DQ

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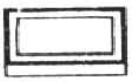

First I must mention that I now have a fax on the same number as my telephone. It uses a fax switch, so if the phone is allowed to ring for too long, the fax will answer. However, it may make it easier for some of you to send your articles and comments to me.

Next, a few points arising from the last issue. In his article on upgrading Ed Long mentioned the maths co-processor; you should appreciate that this is NOT a general go-faster modification, it only works with programs written to use it - such as spreadsheets and CAD systems. And in my own article on disc drives I should have mentioned that older drives have a terminating resistor in a DIL socket; this is normally removed on all except the final drive in a chain. If this is not done the drives may not work properly.

When giving details of products I normally quote the recommended price from the supplier, but often substantial discounts can be obtained by shopping around. I notice that Wildings, a chain of office equipment suppliers, have reduced the PC-3000 from £799 to £599 (+ VAT). Don't forget most prices are quoted without VAT in most magazines and shops. Also watch out for carriage - you can be charged £10 even for very small items.

****

Morgan Computers have shops in London, Birmingham & Manchester, and also operate a mail order service, with some very good deals on end-of-line equipment. Current offers include Sharp's PC-6220 notebook (80286, 12Mhz, 1mb RAM, VGA, DOS 4 and Laplink, 20mb HD) at £499 + VAT. Also the PC-6240 (same but with 40mb hard disc) at £550 + VAT. These models do not have an internal floppy drive, as software is meant to be transferred to the hard disk from another machine using the Laplink software supplied. There is however a connector for an external 1.44mb 3.5" disk drive.

Morgans also have a good selection of printers, and their sales sheet, the 'Morgan Flyer', is issued on a monthly basis. Contact:

Morgan Industries (UK) Ltd., Unit 25, Derby Road,
The Metropolitan Centre, GREENFORD, Middx UB6 8UJ

Morgans Mail Order Dept. is on 021 456 5565 (or FAX 021 456 5564), and you can ring there to get the addresses of their shops.

****

PEAK Computers currently have a special offer on :

MS-DOS 5 PACKAGED VERSION from £31
WINDOWS 3.1 OEM from £31

PEAK can be contacted on 0245 351248 (or FAX 0245 353946)

Microsoft DOS 5

After the DOS 5 notes in the last issue, Microsoft have made a few comments. The only Sharp machine on their own compatibility list is the Sharp AX-386LC (N.B. compatibility tests are carried out by the manufacture, not Microsoft). Like much modern software, DOS 5 is meant for a hard disc, but it can be installed on four 3.5" discs. They also point out that two versions are available:-

The UPGRADE version, sold as a retail item, has a COLOURED picture on the box; it is designed to upgrade earlier versions of DOS. It includes facilities to restore the old DOS, and can be run from drive A: or B:. Support for this product is provided by Microsoft.

The PACKAGED version should only be supplied with a new PC and has a BLACK & WHITE picture on the box. It is bootable and must be ordered in the correct disk size for your drive A:. Support for this should be provided by the hardware supplier.

As an experiment I upgraded DOS 2.11 on my PC-4501, to DOS 5. The install routine checks the system before creating the working disks. It produces one bootable system disk, plus three other disks of utilities. Limited testing has revealed no problems, but if you want to use all its features, a lot of disk swapping is needed. However, many of its features are not really relevant to a basic 8086 PC with only 640k, CGA graphics, and a single floppy.

For higher-spec. computers I certainly recommend the UPGRADE, which is relatively cheap. I particularly like the full-screen editor (which replaces EDLIN), QBASIC (which is vastly superior to GWBASIC), and the HELP available for each command by adding /?. The upgrade is also be useful for business users, who can now put the same version of DOS on all their computers, even if their machines were originally purchased with different versions.

I next plan to cover Windows 3.1 (N.B. it needs a 286 or better, 2Mb RAM, a hard disk, and ideally VGA graphics and a mouse).

PC-7000/7100/7200 portables

I have recently had a number of enquiries about these. Maurice, who recently acquired a 768K PC-7000A, sends the following:-

The PC-7000A (1985) has an 8086 processor running at 7.37 MHz, 384K RAM (expandable to 768K), two 5.25" 360K FDD's, an 80 x 25 LCD screen, and an 84-key keyboard. It runs MS-DOS 2.11, and is fully XT-compatible. Optional extras include the CE-710E expansion box (which can take a hard drive), the CE-700P thermal printer, and the CE-720A Colour/Monochrome CRT adaptor.

The PC-7100 is similar to the PC-7000A, but in place of one of the FDD's, there is an internal 20MB HDD (no expansion box needed).

The PC-7200 (1988) has an 80286 chip running at 6, 8 or 10 MHz, 640K RAM (expandable to 1.6M), one 5.25" 1.2M FDD plus a 20MB HDD, an 80 x 25 CGA screen, and a 102-key keyboard. It runs MS-DOS 3.2, and is AT-compatible. It was reviewed in PCW, March 1988.

If you have one of these machines, or can add anything to the above, please let me (M.M.) know in time for the next issue ***

PC-3000 NOTES by Mike Mallett

DIP, who designed the PC-3000 for Sharp, have recently issued a new catalogue which includes the following :

PC PIMS - this is the Personal Information Management System as included in ROM on the PC-3000. PC PIMS is on disk, ready to run on a desktop PC. All information can be transferred between the two using an optional cable (£79-95, cable £20).

MAC PIMS - similar to above but for the Macintosh (ff as above).

Games Pack - Adventure, Backgammon, Cribbage, Draughts, Maze, Nine Men's Morris, Patience, Solitaire, 3D Noughts & Crosses (disk £49-95, or ROM card £99-95).

Power Management Utility - provides extra system control (ff TBA).
TIMEplus Organiser - Personal manager with database (£199-95).
TIMEplus REMOTE - time and expense management system for remote staff (£199-95). To be used in conjunction with TIMEplus HOST on a Desk-top system (ff TBA).

Sales Clincher Solo - personal sales administration and lead tracking system (£149-95).

Stoplock III - system access, control, and encryption (£194-95).

Leather carrying case (£39-95); AC Adaptor (£34-95)
Serial adaptor (£24-95); Parallel adaptor (£29-95)
Mouse pen (£74-95); Tracker ball (£74-95)
3.5" floppy drive (£229-95) <<< !!!!!!!!!!!!!!! >>>
Laplink/serial modem cable (£34-95)
Parallel printer cable (£34-95)
Hard disks 40, 80 or 100mb (ff TBA)
LAN adaptor (£299-95)
PCMCIA SRAM cards - 128, 256 or 512kb, 1, 2 or 4mb. (ff TBA)
FLASH cards - as above plus 8, 10 or 20mb. (ff TBA)
A range of modems are also listed.

Incidentally, many larger machines now include a PCMCIA card slot, such as the one fitted on the Sharp PC-6781 and the Amiga 600.

Also a list of standard PC software that runs on the PC-3000 :

ACT I 2.0
Autoroute 2.1
Crosstalk XVI 3.7
cc:Mail 3.20
Kermit 2.27
Laplink III 3.0
Letter Perfect 1.0
Lotus Metro 1.1
Lotus Works 1.0
Lotus 123 2.20
MS Flight Simulator 4
Microsoft Word 5.5
Microsoft Works 2.0
Norton Utilities 6.0
Procomm Plus 1.1
Quattro Pro 3.0
Sidekick 2.00
Word Perfect 5.1
Xenon 2
Xtree Net
Xtree Pro Gold

Any standard PC software which does not need over 640k RAM will be suitable (but check that it supports MDA or CGA graphics).

All prices exclude VAT. For details call DIP on 0483 301555.

Battery Watch Pro

Traveling Software, who specialise in software for portable PCs, have sent me the latest version of their battery-checking utility. The current version is listed as supporting the Sharp PC-4521, PC-5541 and PC-6220 (other brands are also listed) but it can be tuned to work with other models. Normally DOS 3.1 or higher, or Windows 3.x is required, plus a hard disc. The main features are :

Includes both DOS and Windows versions
Fuel gauge (if supported) shows estimated battery time remaining
'Deep Discharge' helps extend the life of the NiCad battery
Alarm setting gives automatic notice of remaining computing time
In-built help provides immediate assistance
RAM resident, requires only 9 to 16K of RAM.

No doubt if you are a serious laptop user you will know that actual battery life under working conditions is usually only between 2 to 3 hours, and it normally gives up in the middle of a vital job! 'Battery Watch Pro' is like a 'fuel gauge' which can be called up at almost anytime to check on the capacity remaining. Also, up to three alarms will remind you when the battery is low.

NiCad (Nickel Cadmium) batteries can suffer from a memory effect which reduces their capacity unless they are fully discharged and recharged. The 'Deep Discharge' utility completely discharges the battery by maximising power consumption, mainly by running the disc drives. This also helps to extend the life of the battery.

Although my Sharp PC-4501 does not have a hard drive, I was able to install the program in the space left on my system disc. The program can then be started automatically every time the computer is booted. All the functions described worked well, but I will go into more detail after a longer-term test. Of course I cannot use 'Deep Discharge', as my computer uses a lead acid battery. The complete package sells at an RRP of £35 + VAT.

Other Traveling Software products include :

Laplink Pro - for file transfer between PCs; this was mentioned in Volume 12 Number 1. A version of this is included with Sharp portables which have no floppy disc drive, such as the PC-6220.

Laplink Mac - for file transfer between a Macintosh and a PC. or between Macintoshes using Appletalk.

Winconnect - for file transfer between PCs running Windows
Desklink - for file and printer sharing between two PCs

Traveling Software can be contacted at Lords Court, WINDSOR, Berkshire SL4 3DB, or on Reading (0734) 321154.

****

GET TOGETHER FOR ALL YOUR CONNECTIONS AND CABLES!

Connexions can offer virtually any type of connector or cable, and related tools and test equipment. They are on 0707 272091. They produce an excellent catalogue, but they appear to be aiming primarily at the business user - the minimum order is £50.

PC graphics specifications

(Or what to look out for when buying a new or second-user PC)

N.B. Desk-top PCs can usually be upgraded by changing the graphics adaptor and the VDU; but portables are not easily upgraded.

MDA - Monochrome Display Adaptor. Introduced in 1981 this gives high resolution text, but only on a monochrome monitor.

CGA - Colour Graphics Adaptor. Introduced in 1981 this gives low resolution 320 x 200 in 4 colours. Individual letters are only 8 x 8 which is not ideal for heavy text use.

EGA - Enhanced Graphics Adaptor. Introduced in 1985. This allows resolutions of up to 640 x 200 in 16 colours.

VGA - Video Graphics Array. Introduced in 1987 with a higher resolution of up to 640 x 480 in 16 colours.

These are regarded as the 'official' IBM standards; they are used on Sharp portables, according to date, and most software supports them. Other standards exist, but Sharp do not normally use them, and full software support is not always available:-

Hercules Graphics - Introduced in 1982 by Hercules. This allows a monochrome monitor to display high resolution 720 x 348 graphics.

VGA-Super and VGA-Extended give higher resolution and more colors. Some software will need special drivers to make use of them.

More on adding drives to the Sharp PC-4501

I have yet to finalise the second 720k drive on my PC-4501. As you know, I got one drive to run O.K., but as it could also work at 1.44mb (NOT supported on the Sharp) it is now in my desktop PC. FRC lent me a drive (NEC FD1137H) which was a perfect physical fit but did not want to work in the Sharp, though it ran O.K. in my desktop . Perhaps I should look out for a Sharp PC-4502, which came with two drives; or has anyone got a spare Sharp drive ?

The PC-4501, like many other portables, has an external FDD socket. It is 25-way D-type, meant for Sharp's 5.25" CE-542F disk drive (or the MZ-1F19 drive for the MZ-800). Neither unit is still available new, but the pin-out is shown in the Manual, so I made up a lead to a BBC drive. But it did not work. Can anyone help ? Incidentally the external drive is called C:, so you can have two 3.5" drives as A: and B:, plus a third EXTERNAL drive.

I have mentioned before that fitting an internal HDD is not easy or cheap. However, several companies supply an HDD that plugs into the printer port. Although not portable, and only meant for use 'back at base', virtually any size of HDD can be supplied. One source for this type of HDD is Stratum Technology on 0734 441236.

One point I came across which is not really documented. Like most PCs, the Sharp uses disks in the double density (MFM) mode; but it appears also to work in single density (FM) mode if the correct software is used. This would make it able to read disks from earlier machines, including some CP/M formats. ***

Public Domain and Shareware programs

Ed Long has tested and recommended a number of programs which will run on an unexpanded PC-4501:-

Ford Simulator. This is driving simulator issued by Ford USA. It allows you to choose a Ford car to drive on a number of tracks. When you have finished driving it gives you information on a number of features such as braking, suspension and steering. It even works out your HP repayments !

HOTDOS allows you to exit from a program with CTRL+ALT, issue a DOS command, and then return to the program.

DOSAMATIC allows you to run up to seven programs at one time, as well as offering advanced facilities, and a menu system.

****

Reynir Stefanssson (Mad Cat), as you may know from the MZ-700 section in the last issue, also has a PC (not a Sharp). He is working on an MZ-700 emulator to run on the PC. He has also come across a Spectrum emulator complete with Manic Miner! Reynir also recommends a text editor called VDE (Visual Display Editor) which has Wordstar-type commands, but is a lot more compact and faster. He has a number of other PD programs, and he has also written a small collection of useful utilities.

****

I recently contacted Larry and Peter Galliford, who were closely involved with the SUC in 1985-86. They are now running a company called LJ Supportware Ltd which can offer :

Computer Consultancy
Computer Books
Database programming
Disk Duplication service
DTP/ Graphics/ WP Bureau
Online BBS Information Service
Shareware
Software Training
WordPerfect Corporation Support

LJ may be contacted at PO Box 1638, MAIDENHEAD, Berks. SL6 7YZ.
Telephone 0628 37292; Fax 0628 23335; Bulletin Board 0628 23348

****

Just before the deadline I heard from Greg Chapman. He strongly recommends the 'freebie' disks "50 Hot Utilities" and "75 Power User Utilities", as recently supplied with the UK edition of PC Magazine. I hope to cover these in detail as I am sure there is something to interest everyone. Greg also mentioned that an early version of Sidekick has been issued on a magazine coverdisk.

****

Lastly, if you are interested in Public Domain software and shareware, read the new 'Comms Corner' section in this issue.

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Welcome to COMMS Corner

After a recent chat with Peter Tuffs, who has been considering setting up an SUC Bulletin Board, I detect a lot of interest in the subject. Although my main interest is PCs, I am starting a separate section, because almost any computer can be used to get going. I hope users of other Sharp machines will chip in.

First you need a modem (Modulator-demodulator). This is usually an external device, which connects the computer serial port (an optional extra on older Sharp machines) to a standard BT socket. However, internal modems are also available as PC cards, and Sharp offer special internal modems for some of their portables. Modems are available secondhand (e.g. V21 and V23 for £30 - £50) - O.K. to start with, but you will want a faster one once you are hooked.

Terminology

V21 = 300 baud, roughly equivalent to 30 char/sec, this is an old basic standard, normally only used as fallback on bad lines.
V22 = 1200 baud, mostly employed for casual use.
V22 bis = 2400 baud.
V23 = 1200 receive, 75 baud transmit. A U.K standard, originally developed for Prestel etc. Some Bulletin-Bs cannot use this.
V32 = 9600 baud
V32 bis = 14400 baud
V42, V42 bis and MNP are error corr./data compression standards.

1200 baud fills a screen at fast reading speed; but to handle large files, higher speeds are useful and reduce the 'phone bill!

'Hayes' commands, found on newer modems, allow the modem to be controlled from the computer; this normally includes autodialling.

Modems, like telephones, come with BT's Green or Red stickers.

You need software. There are many levels of sophistication, and you may find programs for your computer in Shareware, or in the P.D.; or you can write your own if you are stuck. Terminology:-

Terminal emulation: gives standard scrolling text used by most services. May include emulations of specific terminals such as VT100, ANSI or H19, which are usually 80-column text.

File transfer - various protocols, usually including error checking, are needed if you wish to transfer files.

Viewdata emulation - needed for Prestel, Silicon Village and other viewdata services; uses 40-col. graphics, similar to Teletext. Originally designed for V23, but most services are now faster.

More next time ....

COMMS corner - continued

The Club does not at present have an operational bulletin board; but Peter Tuffs has a selection of CD ROMS, with over 500 Mb of Public Domain and Shareware material, mainly for PC's. As this is not yet on-line, as an interim measure he is prepared to supply members with a limited selection on disk. Call him for details.

Peter and I can assist with modem software for a PC. Can members of other sections help on other machines ?

Some telephone numbers to try

'Scrolling text' systems - most speeds - are available on:-

LJ Supportware 0628 23348 (includes shareware library)
BOOG 0252 626233

Silicon Village - a welcome replacement for Micronet (shut by BT). A subscription is payable, but demonstration access is possible on 081 759 6996 or 0734 819000, using the ID 4444444444, followed by the Password 4444. Normal (subscriber) access is available on a local number via Mercury for most users.

Modems may be obtained from:

Miracom on 0800 225252 (all calls are free) or FAX 0753 811191
Personics on 0252 311332 (FAX 0252 311660), or see the BOOG BB

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The Sharp ZY-1000 'PC-TYPEWRITER' by Maurice Hawes

Nothing to do with modems - but an epilogue about the strangest computer that Sharp ever produced. The ZY-1000 is a very large daisywheel typewriter (Diablo 630 emulation) with an XT-compatible computer in its base. It may be switched to operate either as a sophisticated electric typewriter with a 40 x 1 LCD display, or as a PC with MS-DOS 2.11, twin 5.25" 360K floppies, and an 80 x 25 LCD display on a pole at the back of the machine! I acquired the machine only a week ago, but tests already indicate that the PC side is based on the PC-7000A (reviewed earlier in this section).

Many keys on the keyboard are marked in three colours - red and black for electric typewriter functions, and green for computer functions; but the oddest thing of all about the ZY-1000 is the 'SAMNA ONE' word-processing package that Sharp bundled in for use with the PC side of the machine. This WP produces the weirdest document files I have ever seen, and on the ZY-1000 at least, the sectors on the disk are 'software-scrambled'. In addition, the first 3 sectors of every file (1536 bytes) contain coded data; whatever these sectors may be for, every file (even a 'blank' one) has this 'overhead'; worse still, any file is packed with spaces, and control codes between words, sentences, paragraphs and pages, which increase its size to an incredible degree. For example, one document file that came with my ZY-1000 was 90,000 bytes - but when I converted it to an 'ASCII' file, it was only 22,000 bytes!

Never mind, at least we can now support the Sharp ZY-1000. ***

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